RAILROAD GAZETTE

FRIDAY, APRIL 28.

Train Accidents in March.

The following accidents are included in our record for the month of March:

REAR COLLISIONS.

On the afternoon of the 2d as a freight train on the Pennsylvania Railroad was cut in two, and running some cars on a siding at Conowingo, Md., by a flying switch, the switch was not turned quickly enough, and the rear cars ran into the forward section, wrecking four cars.

On the morning of the 3d a freight train on the Chicago & Grand Trunk road broke in two near Flint, Mich. The engine and a few cars started on at great speed, and, before the engineer could control them, ran into a preceding freight, wrecking the engine and eight cars.

On the evening of the 6th a freight train on the Lake Shore & Michigan Southern road ran into another freight which was going into a siding near Toledo, O, doing much damage.

On the afternoon of the 7th a passenger train on the Vermont Central road ran over a misplaced switch and into a freight train on a siding at Milton, Vt. An engine and several freight cars were badly broken.

On the evening of the 7th a freight train on the Pittsburgh, Cincinnati & St. Louis road, ran over a misplaced switch and into another freight train on a siding in Newark, O. An engine and several cars were damaged.

On the night of the 7th a freight train on the Chicago & Northwestern road, the engineer and fireman of which had been disabled by an explosion, leaving the engine without control, ran into the rear of a passenger train in Chicago, Ill., damaging several cars and injuring three postal clerks slightly.

On the afternoon of the 8th a ballast train on the Cleveland & Marietta road, ran into the rear of a freight which had stopped near Marietta, O., without sending back a flag. The caboose was wrecked and a passenger in it was hurt.

On the night of the 8th a freight train on the Wisconsin Central road ran over a misplaced switch and into a freight train on a siding at Ogemaw, Wis., damaging an engine and several cars.

On the afternoon of the 9th a freight train on the Central Pacific road ran into a lumber car standing on the track in West Berkeley, Cal., doing some damage.

On the night of the 9th a freight train on the New York Central & Hudson River road broke into three parts near Port Byron, N. Y., and the middle section ran into the forward one, wrecking six cars.

On the morning of the 10th a shifting engine on the Pittsburgh, Ft. Wayne & Chicago road ran over a misplaced switch and into a passenger train in the yard at Allegheny, Pa. The baggage car was badly broken.

On the morning of the 15th a freight train on the Pennsylvania & New York road broke in two near Milan, Pa., and the rear section ran into the forward one, wrecking several cars and injuring a brakeman.

On the morning of the 15th some cars broke loose from a freight train on the Lake Shore & Michigan Southern road in Erie, Pa., and ran back down grade and into another freight standing on the track. Several cars were wrecked and the wall of an adjoining building was knocked down.

On the afternoon of the 16th a passenger train on the Baltimore & Ohio road ran into a preceding passenger train which had been stopped near Laurel, Md., by the breaking down of the engine. A parlor car was damaged, three passengers and a brakeman slightly hurt.

On the afternoon of the 17th a freight train on the New York & New England road ran into a preceding freight near Terryville, Conn., wrecking several cars. The caboose caught fire and was destroyed.

On the night of the 17th a passenger train on the Chicago, Milwaukee & St Paul road ran into the rear of a freight near Jackson, Minn. The caboose was wrecked, a brakeman and five others hurt. There was a dense fog at the time.

On the evening of the 20th a freight train on the International & Great Northern road broke in two near Neches, Tex., and the rear section ran into the forward one, wrecking three cars and killing a man who was stealing a ride.

On the morning of the 21st the engine of a freight train on the East Tennessee, Virginia & Georgia road ran into a car loaded with steel rails in the yard in Chattanooga, Tenn. A rail was driven almost entirely through the boiler, breaking the engine badly. The engineer was hurt.

On the morning of the 21st the engineer of a freight train on the Richmond & Danville road was suddenly stricken with paralysis while near New's Ferry, Va. He was unable to stop his engine, and before the fireman saw what had happened the train ran into a preceding freight, damaging several cars and injuring the fireman

On the evening of the 22d a passenger train on the Pittsburgh, Ft. Wayne & Chicago road ran into the rear of a freight train near Chicago, Ill., wrecking an engine and several cars, and injuring the engineer fatally.

On the morning of the 25th a passenger train on the Metropolitan Elevated road ran over a misplaced switch and into the rear of another passenger train at the Courtlandt street station in New York, damaging two cars badly.

On the afternoon of the 25th a freight train on the Troy & Greenfield road ran into the rear of a preceding freight near North Adams, Mass., wrecking an engine and several cars.

On the morning of the 26th a freight train on the East Tennessee, Virginia & Georgia road ran into the rear of a passenger train which had been stopped near Home, Tenn., by the bursting of an air-brake hose. The engine was damaged, a car wrecked, a trainman killed and another badly hurt.

On the afternoon of the 27th a coal train on the Central Railroad, of New Jersey, ran into a preceding coal train near Miner, Pa., piling up a number of cars in a bad wreck.

On the afternoon of the 28th a passenger train on the Kentucky Central road ran over a misplaced switch and into a freight train on a siding at Paris, Ky. An engine and several cars were wrecked.

Early on the morning of the 29th a freight train on the Buffalo, New York & Philadelphia road ran into a preceding freight near Olean, N. Y., wrecking several cars and injuring a brakeman.

On the evening of the 29th a freight train on the Illinois Central road ran into a preceding freight which had stopped at Winthrop, Ia., wrecking several cars.

On the afternoon of the 30th a coal train on the Intercolonial road ran into the rear of another coal train near Grand Lake, N. S., wrecking several cars. The conductor was killed, an engineer and a brakeman hurt.

BUTTING COLLISIONS.

On the night of the 3d there was a butting collision between a passenger and a freight train on the Syracuse, Chenango & New York road near Earlville, N. Y., wrecking both engines and a baggage car, killing both engineers and both firemen, and injuring the baggage-master. It is said that the freight conductor misunderstood his orders.

On the evening of the 7th there was a butting collision between two freight trains on the Lake Shore & Michigan Southern road near Huron, O. Both engines were damaged.

On the night of the 9th there was a butting collision between two freight trains on the Chicago, Milwaukee & St. Paul road near Cedar Rapids, Ia., wrecking both engines and injuring three trainmen.

On the night of the 15th there was a butting collision between two freight trains on the Kentucky Central road near Paris, Ky., damaging both engines and five cars.

On the morning of the 26th there was a butting collision between two freight trains on the Illinois Central road at Mounds, Ill. Both engines and 12 cars were badly broken.

CROSSING COLLISIONS.

On the morning of the 13th a New York Central & Hudson River freight ran into a New York, Lake Erie & Western freight train at the crossing in Batavia, N. Y., wrecking two cars. It does not appear that there were any signals; and the flagman stood where he was hidden from view by the Erie train.

On the evening of the 22d a Chicago & Grand Trunk passenger train ran into a Pittsburgh, Ft. Wayne & Chicago freight train at the stock-yards crossing in Chicago, Ill., wrecking several cars and killing a lot of hogs.

On the morning of the 25th a Chicago, Rock Island & Pacific freight train ran into a Chicago, Burlington & Kansas City freight at the crossing in Eldon, Ia., wrecking two cars.

On the evening of the 30th a freight train on the Indianapolis & St. Louis road ran into a freight on the Belt road in Indianapolis, Ind., damaging several cars.

DERAILMENTS, BROKEN RAIL.

On the night of the 23d five cars of a freight train on the Chicago, St. Paul, Minneapolis & Omaha road were thrown from the track near Humbird, Wis., by a broken rail. A passenger in the caboose was hurt.

On the night of the 25th four cars of a freight train on the New York Central & Hudson River road were thrown from the track at Gasport, N. Y., by a broken rail.

DERAILMENT, DEFECTIVE JOINTS.

On the morning of the 7th the engine and 10 cars of a coal train on the Toledo, Cincinnati & St. Louis road were thrown from the track near Allentown, O., by a defective rail-joint.

DERAILMENTS, SPREADING OF RAILS.

On the afternoon of the 1st several cars of a coal train on the Philadelphia & Reading road were thrown from the track at Mahanoy Plane, Pa., by the spreading of the rails. The ties are said to have been very rotten.

On the afternoon of the 2d the engine of a passenger train on the Albany & Susquehanna road was thrown from the track near Schenevus, N. Y., by the spreading of the rails, and upset down a bank. A boy, who was riding on the engine, was badly scalded.

On the night of the 16th a passenger train on the Cleveland & Marietta road was thrown from the track near Wesley, O., by the spreading of the rails, and one car upset down a high bank, injuring the conductor and 12 passengers.

On the afternoon of the 21st five cars of a mixed train on the New Brunswick & Canada road were thrown from the track near Maxwell's Crossing, N. B., by the spreading of the rails.

On the morning of the 24th the engine and several cars of a construction train on the Chicago, Rock Island & Pacific road were thrown from the track at Glen Park, Ia., by the spreading of the rails. Four trainmen were hurt.

On the morning of the 25th some cars of a coal train on the Salisbury road were thrown from the track at Fairview Mine, Pa., by the spreading of the rails. Seven cars were piled up and wrecked, killing a brakeman.

On the evening of the 25th ten cars of a freight train on the Cleveland & Marietta road were thrown from the track near South Olive, O., by the spreading of the rails.

On the afternoon of the 30th a freight train on the Cleveland & Marietta road was thrown from the track near Point Pleasant, O., by the spreading of the rails.

DERAILMENTS, BROKEN BRIDGE.

On the night of the 10th a bridge over a street in Jersey City, N. J., on the Pennsylvania Railroad's elevated branch to the Harsimus freight station gave way under a ballast train. The engine passed over safely, but 13 cars went down into the street. The bridge was to have been replaced by a new one in a few weeks.

On the 11th a small bridge on the Pittsburgh, Cincinnati & St. Louis road near Xenia, O., gave way under a passenger train and the engine went down into the creek and was wrecked.

On the morning of the 20th a construction train on the Des Moines, Osceola & Western road broke through a bridge at Lothrop, Ia., the engine, two flat cars and a caboose falling into the river with the bridge. Four trainmen and two boys were badly hurt. The bridge had just been finished and the train was the first to cross.

On the afternoon of the 22d a freight train on the Scioto Valley road broke through a bridge near Chillicothe, O., and four cars went down into Paint Creek and were wrecked.

On the afternoon of the 25th a freight train on the Chesapeake & Ohio road broke through a trestle near Hinton, W. Va., and the engine and 22 cars went down and were piled up in a bad wreck. Three trainmen were killed and one hurt. The trestle was being repaired at the time, but was supposed to be safe.

DERAILMENTS, BROKEN WHEEL.

On the morning of the 18th a wheel broke under the tender of a passenger train on the New York Central & Hudson River road just as it was approaching the high bridge over the Erie Canal at Lockport, N. Y. The tender was thrown from the track and dragged upon the bridge, but the guard-rails kept the cars on the track and the train was stopped on the bridge.

On the night of the 26th as a work train on the Northern Pacific road, consisting of several flat cars, two sleeping cars full of laborers, a dining car, kitchen and store car, was approaching a trestle bridge near Sweetbriar, Dak., a wheel broke under a flat car and it was thrown from the track and dragged on the bridge, tearing out the ties. The two boarding cars went off the bridge and fell 30 feet into the creek, with the dining and kitchen cars on top of them, and the wreck at once caught fire and was burned up. Five men were killed by the fall or burned to death and 26 others were hurt.

DERAILMENT, BROKEN AXLE.

On the afternoon of the 13th a passenger train on the Cincinnati, Indianapolis, St. Louis & Chicago road was thrown from the track near Lawrenceburg, Ind., by a broken axle under the tender.

On the 16th several cars of a freight train on the Cincinnati, Hamilton & Dayton road were thrown from the track near Sidney, O., by a broken axle.

On the afternoon of the 16th seven cars of a freight train on the Northeastern Railroad, of Georgia, were thrown from the track at Nash's Tank, Ga., by a broken axle. Several cars were badly broken.

Very early on the morning of the 26th five cars of a coal train on the Central Railroad, of New Jersey, were thrown from the track near Plainfield, N. J., by a broken axle.

DERAILMENT, BROKEN TRUCK.

On the morning of the 10th a car of a freight train on the Pittsburgh, Ft. Wayne & Chicago road was thrown from the track at Emsworth, Pa., by a broken truck.

DERAILMENT, LOOSE WHEEL.

On the morning of the 28th a passenger train on the St. Johnsbury & Lake Champlain road was thrown from the track near Cambridge, Vt., by a loose wheel in the engine truck. The engine and two cars went down a bank, and the engineer was hurt.

DERAILMENTS, WASH-OUT.

On the night of the 1st a passenger train on the Ogdensburg & Lake Champlain road ran into a wash-out near Mooers, N. Y., and the engine and baggage car were wrecked, killing the engineer and fireman and injuring two other train men.

On the morning of the 2d a freight train on the Vermont Central road ran into a washed-out culvert near Swanton, Vt., wrecking the engine and several cars, killing the fireman, injuring the engineer and a brakeman.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the night of the 1st a passenger train on the Baltimore & Ohio road struck a stone which had fallen on the track near Parkersburg, W. Va. All the train but the sleeping car left the track and the engine ran into a store close by, wrecking and setting fire to it. The engineer and fireman were killed.

On the night of the 3d the milk train on the Hartford & Connecticut Western road struck a rock which had fallen on the track near West Norfolk, Conn., and the engine and three cars were thrown from the track and down a bank.

On the morning of the 7th a passenger train on the Chesapeake & Ohio road struck a rock which had rolled on the track near Clifton Narrows, W. Va., and the engine and baggage car were thrown from the track and went down a bank into the Kanawha River. The engineer was killed and a fireman badly hurt.

On the evening of the 15th five cars of a coal train on the New York, Lake Erie & Western road were thrown from the track in Port Jervis, N. Y., by a brake beam dropping down on the rails.

Late on the night of the 19th a freight train on the Pennsylvania Railroad struck the wreck of a freight car which had been thrown from the opposite track a moment before, near Downingtown, Pa. The engine and eight cars went down a high bank and were piled up in a bad wreck. The fireman was killed, and the engineer fatally hurt.

On the night of the 21st 15 cars of a coal train on the Lehigh Valley road were thrown from the track near Allentown, Pa., by a rock which fell upon the track in a side-hill cutting. The road was blocked three hours.

On the night of the 28th a passenger train on the Minneapolis & St. Louis road struck a rock which had fallen on the track in a cut near Hastings, Minn. The engine was badly damaged and the baggage car thrown from the track.

On the morning of the 31st a freight train on the Illinois Central road was thrown from the track near Pana, Ill., by a log which had fallen on the track and caught in a cattle-guard. Ten cars went into the ditch.

DERAILMENTS, CATTLE.

On the night of the 9th a passenger train on the Philadelphia & Reading road ran into a herd of cattle at Landingville, Pa., and three cars were thrown from the track, blocking the road all night.

On the morning of the 13th a freight train on the Scioto Valley road ran over a horse near Kingston, O. Several cars were thrown from the track and a brakeman killed.

DERAILMENTS, MISPLACED SWITCH.

On the evening of the 8th the engine of a freight train on the Cleveland, Akron & Columbus road was thrown from the track in Mt. Vernon, O., by a misplaced switch.

On the morning of the 9th a freight train on the Worcester road was thrown from the track at Snow Hill, Ind., by a misplaced switch. The engine fell over down a bank and three cars were piled up on top of it in a bad wreck.

On the afternoon of the 20th the engine of a freight train on the Lake Shore & Michigan Southern road was thrown from the track in the yard at Cleveland, O., by a misplaced switch.

On the morning of the 25th several cars of a freight train on the Evansville & Terre Haute road were thrown from the track at Sullivan, Ind., by a misplaced switch.

MISCELLANEOUS DERAILMENTS.

On the evening of the 11th a car of a freight train on the Cleveland, Akron & Columbus road was thrown from the track near Millersburg, O., by a low bridge striking the top of the car, which was very high.

On the morning of the 15th a passenger train at the New York, Lake Erie & Western depot in Buffalo, N. Y., ran off the end of a siding and into the depot, knocking down part of the roof.

UNEXPLAINED DERAILMENTS.

On the morning of the 1st a car of a freight train on the Rensselaer & Saratoga road ran off the track in Troy, N. Y., and upset, injuring a brakeman.

On the afternoon of the 1st the engine and several cars of a freight train on the Chicago, Burlington & Quincy road were thrown from the track near Opheim, Ill., and wrecked, killing the fireman.

On the night of the 3d a snow-plow and caboose on the Northern Pacific road jumped the track near Marshall, Wash. Ter., and the caboose upset, injuring two brakemen.

On the afternoon of the 6th several cars of a freight train on the New York, Lake Erie & Western road ran off the track near Ridgewood, N. J., blocking one track two hours.

On the afternoon of the 8th a car of a freight train on the Ohio Division of the East Tennessee, Virginia & Georgia road ran off the track close to a trestle bridge near Black Oak Ridge, Tenn. The car ran on the bridge on the ties and knocked down two of the bents, and a passenger car attached went through and was wrecked, injuring the conductor and six others.

On the 9th the engine of a freight train on the Denver & Rio Grande road became unmanageable near Malta, Col., and ran down grade at great speed, finally jumping the track at the foot of the grade. It went down a bank and was wrecked.

On the night of the 11th a passenger train on the Denver & Rio Grande road ran off the track near Alpine, Col., and went down a bank, wrecking engine and cars, killing a brakeman and a passenger, injuring four passengers.

On the night of the 13th a freight train on the Indianapo-

lis & St. Louis road ran off the track near Alton Junction, Ill., and 20 cars went down a bank.

On the morning of the 15th the engine of a coal train on the Philadelphia & Reading road ran off the track at Big Mine Run, Pa., blocking the road an hour.

On the afternoon of the 15th a yard engine on the St. Louis, Iron Mountain & Southern road ran off the track in Carondelet, Mo., and upset, killing one man and injuring two others.

On the morning of the 16th a car of a freight train on the Louisville & Nashville road was thrown from the track at Baker's Hill, Ky., blocking the road several hours.

On the night of the 19th a car of a freight train on the Pennsylvania Railroad jumped the track near Downingtown, Pa., and was thrown over on the opposite track, causing another wreck.

On the morning of the 24th the engine and nine cars of a freight train on the Chicago, Rock Island & Pacific road ran of the track near Council Bluffs, Ia., and several cars were badly broken.

Very early on the morning of the 25th some cars of a freight train jumped the track in the Pennsylvania Railroad yard in Pittsburgh, Pa. The cars ran into a small office beside the track, wrecking it completely.

On the morning of the 25th a car of a freight train on the Oregon & California road ran off the track in a cut near Drain, Or., blocking the road three hours.

On the evening of the 25th several cars of a freight train on the St. Louis & San Francisco road ran off the track near Republic, Mo., and were wrecked. Two tramps, who were stealing a ride, were killed and a third was badly hurt.

On the morning of the 28th the caboose of a freight train on the Wabash, St. Louis & Pacific road jumped the track in Eldorado, Ill. A brakemen was thrown under the cars and killed.

On the morning of the 31st a passenger train on the Pittsburgh Southern road ran off the track near Pittsburgh, Pa. The engineer was hurt.

BOILER EXPLOSION.

On the night of the 7th some of the attachments (not clearly described in the dispatch) in the cab of the engine of a freight train on the Chicago & Northwestern road, in Chicago, Ill., were blown out, scalding the engineer and fireman badly. This left the engine without control and caused a collision as noted elsewhere.

OTHER ACCIDENT.

On the 21st a car in a freight train on the Memphis & Charleston road caught fire when near Stevenson, Ala., and was partly destroyed.

This is a total of 99 accidents, whereby 29 persons were killed and 101 injured. Twenty-four of the killed and 62 of the injured were railroad employés, while 5 of the killed and 39 of the injured were passengers or persons riding on the trains.

As compared with March, 1881, there was a decrease of 14 accidents, of 9 in the number killed and of 76 in that injured.

For the three months of 1882 there have been reported 324 accidents, 93 killed and 368 injured, a monthly average of 108 accidents, 31 killed and 123 injured.

March shows more accidents than February, but fewer than January, and a decided improvement on March of last year.

An English Goods Station.

II.

Probably to most of our readers, the whole subject of the use of hydraulic power for the handling of freight will be new, and therefore we will devote some space to describing the way in which it is applied and the mechanism which is used.

It must be kept in mind that in machinery of this kind hydraulic pressure is used simply as the most convenient vehicle for transmitting and distributing power long distances and over large areas. In such cases, to quote from a paper by Mr. Ralph Twiddle, read before the Institution of Mechanical Engineers in 1872:

"Shafting is, however, very expensive, requiring many standards and supports, and involving great weight of pulleys, geared wheels, and plummer blocks; it requires great care in erection, and constant attention while running; it is wasteful of power in friction, and wear and tear of leather belts, and is a frequent source of danger. Another serious objection is that it involves a constant demand on the engine for a large amount of power, whether the machinery in connection with it is running or not."

Neither is the use of compressed air economical, owing to the loss of power consequent upon the liberation of the heat developed in compressing the air, the heat so liberated being lost before the point of application is reached; and the fact that leakages could not be detected by sight as in the case of water or steam.

Where the distances are great or many points must be reached, it is not practicable to extend steam pipes to wherever power will be required, nor to have steam engines in different parts of the premises.

The idea of using hydraulic pressure for the purpose of transmitting and distributing power originated a long time ago. In 1802 Joseph Bramah, the inventor of the hydraulic press, wrote to Robert Mallet: *

"I have also now applied it [the hydraulic press] with the most surprising effect to every sort of crane for raising and lowering goods in and out of warehouses. So complete is the device, that I will engage to erect a steam engine in any part of Dublin, and from it convey motion and power to all the cranes on the quays and elsewhere, by which goods of any weight may be raised at one-third of the usual cost. This I do by the simple communication of a pipe just the same as I should do to supply such premises with water. I have a crane on my premises which astonishes every person to whom it has been shown, as they see the goods ascend and descend 15 or 20 times in a minute to the height of 18 or 20 ft., and at the same time it is impossible for any person unacquainted with the principle to discover how or where the power comes from."

To Sir William Armstrong, however, belongs the credit of having worked out the machinery and applied water pressure systematically as a means for the transmission of power.

*See proceedings of Institution of Mechanical Engineers, Jan. 30, 1868, page 40.

In a paper read before the Institution of Mechanical Engineers in 1858, he said that his attention was first attracted to water pressure machinery about 23 years before on occasion of his noticing a small stream of water which flowed down a steep declivity and turned a single over-shot wheel near the end of its course. Observing that portion of the fall which was thus utilized by the wheel was not more than a twentieth part of the whole descent, he was forcibly struck with the inadequacy of the wheel as a means of realizing the power of such a fall; and conceiving it practicable to render the entire head available by bringing down the water in a pipe, and causing it to act by pressure upon a suitable machine at the bottom, he applied himself to devising an engine to be worked by such pressure.

The machine which was first constructed by Sir William Armstrong was a species of rotary engine, which was first tried in Newcastle with the pressure from the street water pipes, equivalent to a column of about 200 ft. Afterwards it was tried in Gateshead with a still greater pressure, and

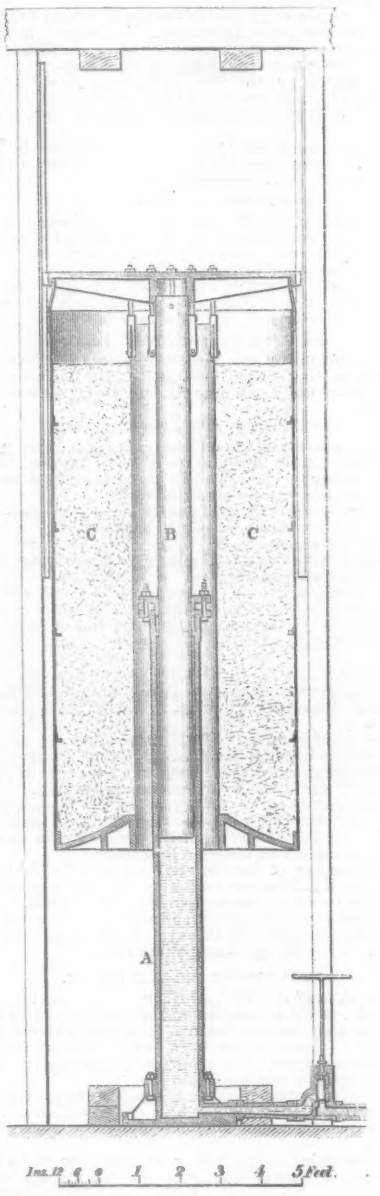

Fig. 3.

it is said in both cases "it yielded a very high effect in relation to the theoretical power of the moving column."

In the year 1846 he constructed the first hydraulic crane which was erected at the upper end of the Newcastle Quay, "where it has ever since continued to do good service in discharging ships." Soon thereafter he introduced the hydraulic crane at Liverpool, and then at the New Dock at Grimsby, where the same kind of machinery was used for opening and closing the lock gates and sluices.

At Newcastle and Liverpool the supply of water was derived from the pipes communicating with the town reservoirs, the effective head of which was about 200 ft. At Grimsby a tower was built for supporting a tank, into which the water was pumped by a steam engine. In the paper referred to the writer says:

"In the former cases the irregularity of pressure consequent upon the variable draught from the pipes for the ordinary purposes of consumption proved a serious disadvantage; but this objection was not experienced at Grimsby, where the tank upon the tower furnished a separate source of power, undisturbed by any interferences. But the erection of a tower was a formidable undertaking, and so long as it remained a necessity a great extension of the principle could not be anticipated. The writer, therefore, resorted to another form of artificial head, which possessed the advantage of being applicable at a moderate cost in all situations, and of lessening the size of pipes and cylinders by affording a pressure of greatly increased intensity. The apparatus by which this is effected, which was introduced in 1851, is named the 'accumulator,' from the circumstance of its accumulating the power exerted by the engine in charging it. The accumulator is, in fact, a reservoir giving pressure by load instead of by elevation; and its use, like every provision of this kind, is to equalize the duty of the engine in cases where the quantity of power to be supplied is subject to great and sudden fluctuations.

"The construction of the accumulator is shown in the vertical section, fig. 3. It consists of a large cast-iron cylinder *A*, fitted with a plunger *B*, from which a loaded weight case *O C* is suspended to give pressure to the water injected by the engine. The load upon the plunger *B* is usually such as to produce a pressure in the cylinder equal to a column of 1,500 ft. head (700 lbs. pressure per square inch); and the cylinder is made sufficiently capacious to contain the largest quantity of water which can be drawn from it at once by the simultaneous action of all the hydraulic machines connected with it. Whenever the engine pumps more water into the accumulator than passes to the hydraulic machines, the plunger rises and makes room in the cylinder for the surplus; but when, on the other hand, the supply from the engine is less for the moment than the quantity used, the plunger with its load descends, and makes up the deficiency out of store. The accumulator serves also as a regulator to the engine; for when the plunger rises to a certain height, it begins to close the throttle valve in the steam-pipe, so as gradually to reduce the speed of the engine, until the descent of the plunger again calls for an increased production of power."

There are two accumulators used at the Forth goods station, which have rams of 17 in. diameter and 17 ft. stroke, and are loaded with 78 tons each.

In his paper Sir William Armstrong says further:

"The real source of power when an accumulator is used is the steam engine employed in pumping water into it, and the water acts simply as a convenient means of storing up the power and applying it whenever wanted at the distant points where the work must be done. The water thus acts merely as a carrier of power, and its function is consequently the same as that of shafting used for conveying the power of a steam engine to different parts of an establishment."

In another paper on this subject, read by the same distinguished author before the Institution of Mechanical Engineers in 1868, he says:

"The superiority of water pressure is only realized in those instances when the machines to be put in motion are scattered over a wide area and are intermittent in their action, and also when the quantity of power to be transmitted is subject to great and abrupt variations. Upon an extended wharf, for example, every crane may happen to be in action at one moment, while at another time not one may be moving; and if shafting were used in such a case for conveying power to the cranes, the engine would sometimes be over-taxed and sometimes be acting without any useful effect. But with water pressure as the medium of transmission, the variation of work is met by the accumulator, and the engine acts always under a uniform load, storing up its surplus power at times when the whole is not transmitted. Moreover, the ramifications readily carried out in laying water pipes are not practicable with shafting, nor can shafting be extended beyond very limited distances.

"Water pressure also possesses the advantage of communicating to machinery a much more controllable and adjustable motion than shafting. The water can be gradually turned on or shut off, and can be admitted as quickly or as slowly as may be desired; while with a shaft the motion acquired is sudden and cannot be communicated gradually. Another advantage of the hydraulic system is that the pipe conveying the water is itself at rest, and does not suffer any appreciable wear nor require any attention; whereas a shaft being in motion is attended with friction and consequent wear, and involves constant lubrication.

"The absence of elasticity in water gives great steadiness and pressure to the movements of machines actuated by water pressure; on the other hand, water being incapable of expanding like steam in a cylinder, the quantity expanded is not proportionate to the load. Thus a machine propelled by hydraulic pressure measures off the same quantity of water, whatever may be the resistance overcome; and therefore when the machine is inadequately loaded the expenditure is more than equivalent to the effect produced. This loss of power may in a great measure be obviated by making the machines with variable powers; but the simplicity of single-power machines renders them preferable in many cases, notwithstanding their greater expenditure of power. In fact, for the purposes to which water pressure is most usually applied, safety, simplicity and general convenience are more to be considered than economy of power, because, owing to the intermittent character of the work required, the quantity of power is not large in the aggregate. It has also to be recollected that, although power is sacrificed by that very property in water which gives so much steadiness and safety to its action, yet the favorable condition under which a steam engine works when pumping against a constant head, as in charging an accumulator, cheapens the production of the power, and compensates for its more lavish application."

Fig. 4, which is copied from a book on "Hydraulic Machinery," by Frederick Colyer, C. E., represents a form of pumping engine usually employed. For working the hydraulic machinery of the Forth station there are two double engines with cylinders 18×24 in., the pump plungers being $5\frac{11}{16}$ in. diameter. There are seven Cornish boilers, 20 ft. 6 in. long and 6 ft. diameter. Usually four of these are worked at one time. These consume about 30 tons of coal per week, the machinery being used about fifteen hours each day.

The construction of the pump used is described as follows by Sir William Armstrong in the paper already quoted from:

"The most approved form is that of two high-pressure cylinders fixed horizontally, with double-acting pumps directly connected with the piston rods. At first a simple plunger pump at each end of the cylinder was used; then, with a view to greater compactness, the pump behind the cylinder was discontinued, and the other made a double-acting one upon the combined bucket and plunger system. Finally a modification of this form of pump was adopted, by dispensing with the clack in the bucket and substituting an external delivery valve *D*, as shown in fig. 5. In this arrangement the out-stroke of the pump causes the water contained in the annular space surrounding the plunger *E* to be forced into the accumulator, while a further supply of water enters behind the piston *F* through the suction valve *G*; in the in-stroke the water behind the piston is discharged through the delivery valve *D*, and half of it passes into the annular space on the other side of the piston, while the remaining half is forced into the accumulator, the area of the plunger *E* being exactly half that of

the piston *F*. Each stroke of the pump thus delivers the same quantity of water into the accumulator."

Each pump is provided with a safety valve which prevents a fracture in case of any sudden shock.

The description of the cranes and other machinery must be reserved until next week.

Contributions.

Performance of Wootten Engines.

BLAIRSVILLE, Penn., April 5, 1882.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your correspondent, in regard to my article of March 17, knows full well that I have not the authority to *require* him to make plain the facts in regard to the performances of Wootten engines, neither do I wish to buy any of those engines. I know as well as your correspondent that some, but not all, of the coal cars on the "Reading" have had their carrying capacity increased, and also know that I am not speaking exclusively of the time before the capacity was so increased. I have counted 125 cars in a train since the increase was made. This increase was obtained principally by putting 9 in. plank around the tops of all the wooden cars that would stand the load. They also built some few cars with an increased capacity.

In regard to the volume of heat, I would state that I was referring to a fire of large stove coal in a Wootten fire-box, with the gases passing over a fire-brick wall, becoming too hot and having the draft suddenly checked or cut off by suddenly admitting a quantity of cold air through the regulator in the smoke-box door, thus backing up the gases in the flues, smoke or combustion chamber and fire-box, until the volume was so great as to force itself out, and again being checked and to keeping heating the flues and sheet. I am not speaking of a locomotive motionless in the yard, but in motion on the road.

You admit in your note that the dirt-burner consumes somewhat more fuel than the ten-wheeler. Did your correspondent admit that?

If your correspondent made that admission, and also states that the "Consolidation" engines haul 40 per cent. more load at one-eighth the cost of fuel and can plainly prove these facts, then let him fire ahead and reconcile his statements with the fact that on the 19th of March there was ten times as much stove coal on the coal platform at Monocacy, where all down coal and freight trains take coal, as there was of *refuse fuel* or "buckwheat."

The "Consolidation" engines, according to his (your correspondent) statements, haul most of the coal tonnage, burn most of the fuel, and consequently draw their supply of coal from the largest heap.

Your correspondent cannot explain away the fact that the engines use the coal as seen upon the bunk, and they keep on hand the largest stock of the kind most used.

To go back to the expansion question. By reference to my note book, I find that the Northern Pacific Railroad Company have condemned engines No. 72, 74 and 75 with wide fire-boxes (Wootten style), because the *expansion and contraction was so great that they could not keep the flues and seams from leaking.* These engines were built in 1881 at Baldwin Locomotive Works, and did not have regulator in smoke-box door nor a cast-iron *patent* plate on the back end of fire-box. They were only used during the summer, and now they are on the shop track to have ordinary fire-boxes put on them. I believe if your correspondent can explain away these facts it will be the best kind of an advertisement for the dirt-burner.

Owing to scarcity of time, I have been unable to answer your note before this, although the article was started soon enough.

Yours truly,

E. M. SNYDER.

Papers on Painting.

BY CHARLES L. CONDIT.

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INTRODUCTION.

A talk with our best painters will discover that a painter has need for thought. So far as his eyes are concerned, although he works in what exists only to the eyes, namely, color, a large part of his experience goes on in the dark. The drying of oil, the effects of paints on oil, the causes which crack, destroy and discolor painted and varnish surfaces, are invisible. They must be grasped by a mind looking for them, not by eyes looking at them.

For this reason the painter, whose business it is to paint, not to investigate, has the right of help from investigators. They may not be able to do much for him, but since he must have some sort of form for his ideas about these things he cannot see, but has daily to do with, it is well that he have clear, definite forms. In other words, to use a phrase which is much misunderstood, the painter needs to have his daily experience measured and shaped into a definite theory based upon clearly stated facts. Fortunately this has been done, and the writer's task has been confined largely to harmonizing and *undressing* the work of scientific men.

But this is not the object of these papers. They are intended to interpret the results of practical experience not the writer's.

NO. 1. IMPORTANT THINGS, BUT NOT NEW.

Considered as a useful art, painting is a process of waterproofing. It is its special service in construction to prevent wood and iron from becoming moist. The painter's first duty is therefore to understand the action of water upon these substances, and especially how to prevent it.

1. The action of air alone upon seasoned wood, even if the air contains considerable moisture, does not cause it to rot. The woodwork of ancient churches and cathedrals in Europe has remained sound, although exposed for centuries to air and without paint. Tredgold says, "For timber that is not exposed to the weather, the utility of paint is somewhat doubtful."

2. The action of air containing not more than the usual moisture of air in our climate is to swell and split wood rather than to rot it. In preventing this action of moist air, therefore, we need to treat all sides of the wood facing air. This is practically all sides of the wood not in immediate contact with some solid substance.

3. The first cause of decay in wood is the presence of sap. Painting on such wood only prevents the water of the sap from escaping, and in the confined air the fermenting sap rots the wood the faster. The water also in seeking to escape may raise blisters upon the paint, as will be discovered by picking the blisters, when it will run out. It is probable also that seemingly empty blisters are formed by the gases of such painted wood.

4. The second and most active cause of the destruction of wood is dry rot. This comes with the growth of little plants (fungi) which feed on the woody fibre. They thrive best in warm, damp and close places, as under the floors of warm cellars or basements, but once fairly started are able to live even in a current of not too cold air. Timber built into walls, or over walls not yet dry, is specially subject to it.

Painting over unseasoned timber is also favorable to it—as in fact anything is which shuts out the air from moist but not too damp wood. A piece of timber apparently sound may be full of dry rot, as may be discovered by boring into it.

Wet rot is the general name given to the rotting of wood due to moisture, but not to the presence of the dry-rot fungus. The painter has more to do with this than with dry rot. He should strongly advise that no two pieces of wood should be put together until their surfaces have been covered with paint, unless they are to be protected by their position from all access of water. Especially should the car-painter see to it that the edges and borders of the panels and the inner surface of the panel-strips are painted.

Water getting under the panel-strips will rot away not only the borders of the panels but the substance of the ash window-posts—especially those portions holding the nails and screws. Wherever a plate of iron of any size covers wood the wood should be painted or coated with tar. The iron plate of the Miller patent platform has been a special cause of decay in platform timbers.

In his own special work the painter will see that all cracks are filled with oil and white lead or good oil putty, and that they are thoroughly filled, not merely skimmed over.

5. The alternate wetting and drying of wood causes decay, but of uncertain rapidity on surfaces exposed to free sunlight and air. The painter is more concerned with the checking, swelling and warping caused by such exposure, and also by that roughening and breaking up of fibres which unfits the surface to be a foundation for fine painting.

To sum up the matter in a word, *all wood containing or exposed to moisture (and not submerged in water or earth) needs treatment in proportion as it is shut out from free access to the air.*

But under the ordinary divisions of labor it falls to the painter mainly to prevent the warping, swelling and checking of wood, and the consequent opening of joints and cracks.

We shall return to this subject.

RUSTING OF IRON.

Iron will not rust in perfectly dry air; the presence of some water is necessary, and it rusts more rapidly in warm countries than in cold countries and in warm than in cold weather. Cast iron rusts least rapidly, wrought iron per-

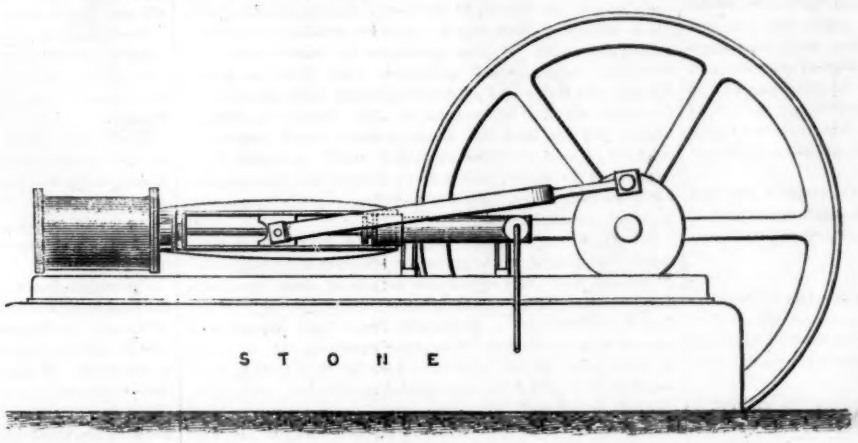

Fig. 4.

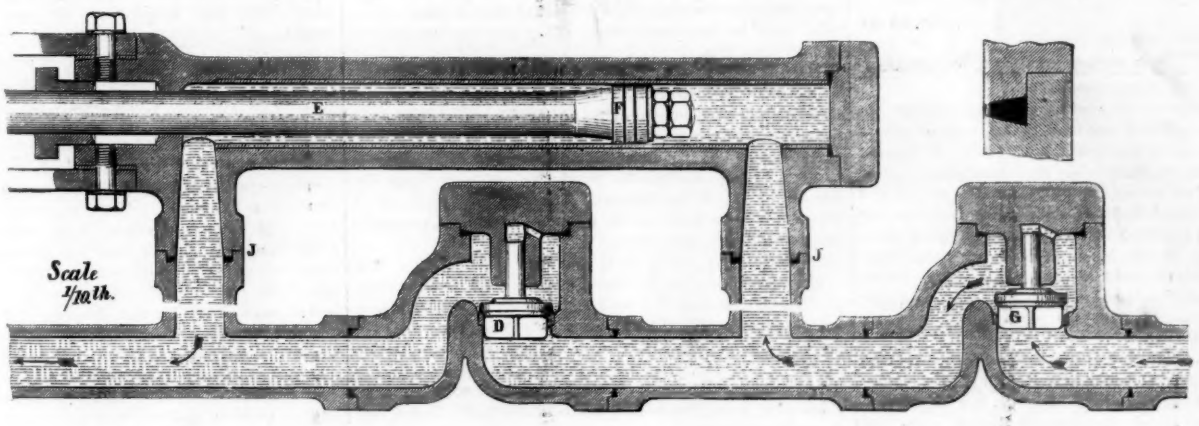

Fig. 5.

ENGLISH GOODS STATION—DETAILS OF HYLRAULIC CRANES.

haps 25 per cent. and steel about one-third faster.* The presence of acids (as carbonic acid) is specially active in causing rust.

Rust contains water, and by its own action causes rust. It is necessary, therefore, to prevent its beginning at any point, or it may extend rapidly over the entire surface, and even under those portions which have been painted.

Galvanized iron is protected from rust only so long as the entire surface is perfect; if broken at any point, the action between the two metals may soon destroy the covering of zinc.

The black (scale) oxide of iron which forms on heated iron (but is apt to scale off rapidly and easily) is a protection to iron against rust. In painting iron it needs to be removed because it so readily becomes loose, carrying the paint with it—from steel because it produces "pitting."

The black magnetic oxide of iron (produced by exposing iron to a temperature of 500 to 1,200 degrees in a chamber containing superheated steam) is probably its best protection against rust, as this oxide remains attached to the iron, and if detached at any point by violence the rust does not extend from that place to others covered by the oxide, as it might do in the case of paint or zinc-covered iron.

Very thin plates of iron rust more rapidly than thick plates, because the scales of rust are thrown off by the greater expansion and contraction of such plates, exposing, as they do, so much surface to heat and cold.

To sum the difficulties with iron: (1.) Iron rusts in the presence of even moist air. (2.) Although the black (oxide) rust protects the iron, it easily scales, while the red rust itself produces rust, which is not the case with substances forming under like circumstances (to a degree) on zinc and copper. (3.) Paint has little to hold by on smooth iron; and (4), the rust can spread under it from any rusted uncovered point. (5.) Finally, the expansion and contraction of iron under heat and cold tend to crack the unelastic layers of paint.

Frequent inspection, brushing away the points of rust and retouching the bare iron, and finally frequent repainting of the entire surface, form the only sure protection to the surface of painted iron.

OILS.

Oils are useful in painting because water has little or no influence upon them. They are valuable to the artistic painter because there is less difference between the shades and colors of dry and wet paints mixed with oil than between dry and wet water colors.

What is an oil? We discover the answer on making it into a soap.

Suet fat.

Soap. { Stearic acid. / Glycerine ether. } Glycerine. { Sodic oxide. / Water. }

Caustic soda.

To those who have never studied chemical formulæ the above may look perplexing, but it will soon become simple after a little attention to the unfamiliar words. Beginning at the bottom of the diagram we see that caustic soda is used to put with oil to form a soap; and that caustic soda has two parts, which are linked together, namely, sodic oxide and water. In making this soap suet fat, or, as it is called, stearine, has been used. It also is composed of parts linked together, namely, stearic acid and glycerine ether. From the mixture of suet fat and caustic soda soap results, which, again, is composed of two parts linked, namely, stearic acid and sodic oxide.

But another substance, glycerine, is also formed of the glycerine ether, which belonged to the suet fat, and of water, which was with the caustic soda.

Oils—that is to say, those oils of which linseed oil is one—are composed of an oil or fat *acid* linked with water-free glycerine—and in making any kind of soap the glycerine is set free, leaving the acid by itself or linked with something else.

Fish oil is largely

Olein.

Oleic acid. — Glycerine ether.

Palm oil, which is used in making fine soaps, is

Palmitin.

Palmitic acid. — Glycerine ether.

Linseed oil is a mixture of

Linolein.

Linseed oil acid. — Glycerine ether.

and of olein and palmatin.

In linseed oil there are 80 parts of linolein (linseed oil acid, glycerine ether), 20 parts palmitin (palmitic acid, glycerine ether) and olein, etc. (oleic acid, glycerine ether).

Soap.—Clear ideas about soap will be very useful in studying oils and paints. Hard soap is made of oil acids and soda, soft soap of oil acids and potash. In making soap the potash or soda is dissolved in water; and this water remains in the soft soap, while from hard soaps it is drawn off, carrying with it the glycerine which was united with oil acid before the soda or the potash displaced it and left it free to unite with the water. The following is an analysis of several kinds of soaps. Some soaps contain also 2 or 3 per cent. of glycerine:

TABLE NO. I.

	Oil acid.	Potash.	Soda.	Water.
Marbled soap (tallow)	81.25	1.77	8.55	8.43
Castile soap	76.50	....	9.00	14.50
Palm oil (yellow)	65.20	....	9.80	19.90
Soft soap (common)	42.80	9.11	...	48.00
" (white)	45.	8.50	....	46.50

* It is doubtful whether steel rusts more rapidly. It probably does *not* if the black scale (black oxide) is removed.

It will be seen that the oil acid, the potash and soda and the water vary in several soaps. The soap is valuable in proportion to the amount of oil acid it contains, *i. e.*, when the soap is to be used for toilet purposes *free* soda or potash and too much of either united with oil acids injure the skin. In washing one's hands, soap removes the grease and greasy dirt which water alone will not dissolve, because water has little influence upon oils. Part of the soda of the soap unites with the dirty oil acids, changing them also into somewhat of a soap which is easily dissolved in water. The other part of the soda remains united with the oil acids of the toilet soaps and forms a lather useful by inclosing and carrying away all particles of dirt, especially greasy dirt, which have or have not been changed by the action of the soda. The action of soap, therefore, is partly chemical (the union of the soda with the grease) and partly mechanical (the removal of dirt by the lather).

It requires time for the oil acid to unite with the soda either in soap making or in hand washing. If a little of the soda unites with the oil acid, there is a weak soap; if more, a strong soap; in each case, however, the soda has taken the place of the glycerine ether which was united with the oil acid. The glycerine ether has been unlinked from the oil acid and set free. Glycerile unites with water and becomes glycerine, which mixes readily with the remaining water.

Lime soaps and lead soaps do not dissolve in water, and by making a lead soap by uniting oil with litharge, it is easy to get the glycerine from the water, because the lead soap falls to the bottom of the vessel, and leaves the glycerine in the water, from which it may be obtained by evaporating the water. If pure glycerine be desired, some sulphur gas (sulphuretted hydrogen) may first be passed through the water and glycerine that any lead dissolved in the water may fall to the bottom. The sulphur in this gas unites with the lead and forms a heavy black powder—a sulphide of lead, the same substance which is found when white lead turns gray (not yellow) after it has been exposed for some time to air. The air of cities, especially, contains more or less sulphur gas.

Oil Acids.—It is plain that oil acids may exist in three states: (1) linked with glycerine ether, thus forming *oils;* (2) linked with such substances as potash, soda, lime, lead, iron, zinc, magnesia, or manganese, forming *soaps;* (3) unlinked and free—*i. e.*, chemically free—from glycerile or soap-making substances, or, in other words, as *free oil acids.* In proportion as oil acids are free do they tend to form soaps when mixed with soap-making substances. Oils—*i. e.*, oil acids linked with glycerine ether—may be mixed with soap-making substances without forming soaps. If two kinds of oils are mixed, one oil may more readily change into soap than the other, when to the mixture is added a soap making substance. The oil acids may change otherwise than by becoming soaps. They may become *rancid*, or they may *dry*.

A LITTLE DICTIONARY.

Oxygen.—One-fifth part of the air; the burning, rusting, change producing element of the air. We breathe oxygen; get fire and light by causing it to unite with wood and coal; it rusts our iron (the iron in our blood), and we live by it; it rusts our iron bridges, and we die by them; we "dry" our oils and burn our oils by oxygen. There is no substance of whose effects we know more by *experience;* it is nearer to our very life than any other.

Carbonic Acid.—The little and heavy gas of air. The product of decay, it produces decay in all living things which do not destroy it; not immediately, but by shutting out oxygen. Living plants change it into starch, starch becomes oil, oil changes again into carbonic acid and water. Carbonic acid destroys lifeless plants (trees and wood) rapidly. Iron rusts quickly in carbonic acid with oxygen. White lead is the rust of carbonic acid and lead. It is a fact of—daily experience.

Glycerine.—To be had of your druggist. It is made from oils and fats.

Glycerine Ether.—Glycerine as it exists in oils, united with an oil acid.

Oil Acid.—An acid which when linked with glycerine ether is known as an oil.

Oil.—An oil acid linked with glycerine ether, and from which glycerine and soap can be made.

Soap.—An oil acid linked with soda, potash, lead, zinc, iron or some such substance. Some soaps do not dissolve in water.

Free Oil Acid.—An oil acid unlinked from glycerine ether, but not united with another substance.

Flying Oil Acid.—An oil acid which becomes lighter than air (due to action of heat or light) and flies away as would a gas.

[TO BE CONTINUED.]

The New Baker Car Heater.

The Spuyten Duyvil accident directed attention anew to the danger attending the use of stoves for heating cars, and, as this kind of warning has been so often emphasized by the sacrifice of life and by death in its most horrible forms, it is not surprising that inventors have been engaged in devising means for diminishing the danger from the use of stoves or heaters. Among those who have given this subject their attention has been Mr. W. C. Baker, late of the firm of Baker, Smith & Co., and the inventor of the old and celebrated "Baker" hot-water car heater.

The idea of locating the fire portion of the heating apparatus beneath the car was conceived by Mr. Baker seventeen years ago, and by others before that time. The difficulties encountered in applying this method are, however, so great that it has generally been abandoned. These difficulties, the inventor thinks, he has overcome in the arrangement illustrated by the engravings herewith.

Fig. 1 represents a portion of the middle part of the body of a car with the heating apparatus underneath. Fig. 2 is a similar view, but the car body is represented in section. Fig. 3 is a section of the boiler and fire-box, and fig. 4 an outside view of the boiler alone.

The vehicle for conveying the heat from the fire to the inside of the car is steam instead of hot water, which is used in what is now known as the *old* Baker heater.

The boiler, as is shown by figs. 3 and 4, is a hemispherical vessel, with a cover bolted or riveted on and with the fire underneath. This or a conical form is used, so that in case the water freezes it will not burst or injure the boiler, as the ice will slide up its inclined and smooth sides without straining it. The bottom, which comes in contact with the fire, is formed in one piece. It is about two feet in diameter on top and one foot deep, and holds about eight gallons of water when filled nearly full, a space being left on top, as shown in fig. 3, for steam. It is inclosed in a cylinder with double sides, the spaces between being filled with mineral wool to prevent radiation. A cast-iron fire-pot, grate and ash-pan are attached underneath the boiler, as shown in fig. 3. This boiler is suspended under the car, as shown in figs. 1 and 2, the steam being conducted up into the car by a pipe attached to the top of the boiler, as shown in figs. 2, 3 and 4, and connected to a transverse branch pipe, shown in fig. 2. This in turn is connected to radiators on the inside of the car, which extend longitudinally along the truss-plank.

The fire is fed through inclined chutes which extend to the outside of the car, the outer ends being inclosed by suitable doors. These chutes may be filled with coal, which, by the motion of the car, will be shaken down and thus feed the fire.

The boiler is filled through a pipe in the side near the top, which is indicated by a small circle in fig. 3 and is clearly shown in fig. 4. The outer end of the pipe is closed by a simple screw plug, which if moved a turn or two with a wrench will open a groove on the under side, which will indicate the water in the boiler, thus answering the purpose of a gauge cock.

The smoke-flue is on the opposite side of the boiler from the supply pipe, and is shown in figs. 1 and 2. The portion of this flue on the outside of the car is usually made round, and is cased and packed with mineral wool about an inch in thickness. It may be run directly up through the car in one of the panels between the windows, or along the truss-plank in place of a radiator, and terminate at the usual point on the roof; or the horizontal portion may run on the under side, near the outer edge of the car body. Inside of the car it may be made oval, oblong or square, or of any other shape best adapted to the position in which it is placed.

The ash-pan, as shown in fig. 3, is screwed to the bottom of the cylinder and supports the grate and fire-pot. Being the lowest portion of the heater, it is most liable to be knocked off in case of accident, and in that event the fire is carried with it. The boiler and fire being inclosed within a double fire-proof casing filled with an incombustible and non-heat-conducting material, there is little danger of communicating fire to the car from the heater.

The pipe through which air is supplied to the fire is shown in figs. 1 and 2. This is but two inches in diameter and is connected to the ash-pan below, and is carried up to the inside of the car to any convenient point. The upper end may be left open, or the air-flow through it may be regulated by a simple damper or cover attached to the end opening within the car.

On top of the boiler is a draught regulator, shown in fig. 2. This consists of a case, with a corrugated steel diaphragm similar to those used for steam gauges. To insure durability and protect it from the action of the steam below and the air above, it is placed between two thin copper diaphragms, one on the under side and the other on top. The steam pressure acts on this diaphragm, which is connected with a weighted lever. The outer end of this is in turn connected with a valve in the smoke-flue, as shown in fig. 2. This regulator can be set permanently, or adjusted to open or close the draft to the fire, and thus control the heat in the car, at pleasure.

A safety-valve, also indicated in fig. 2, is attached to the fire regulator.

The arrangement of the radiators inside of the car is shown by fig. 5. They usually consist of 2½-in. steam pipes, which run close to the truss-plank the whole length of both sides of the car. They have an inclination back towards the boiler, so that all of the water of condensation will run back of its own gravity, and thus will continually be re-converted into steam. The only diminution in the amount of water in the boiler will therefore be that due to leakage. Over the radiators, between the seats, are placed screens, in which the feet of passengers sitting next to the car window can conveniently rest.

On each radiator, at the furthest end from the boiler, there is attached a simple automatic air-valve, constructed of a small brass tube and valve-seat, within an iron tube with a corresponding valve-seat adjusted to close by expanding, the instant steam enters the inner brass tube. It allows the air to escape, but promptly closes before any steam escapes.

It is claimed for this heater that it will not set fire to a car even in the worst accidents; that, owing to its self-feeding features, the fire is easily managed and controlled; that it is not necessary to carry the coal into the car nor the ashes out of it; that the dirt and dust are all kept on the outside of the car, and that it occupies no space on the inside.

It has been tested during the past winter on the New York

BAKER'S NEW CAR HEATER.

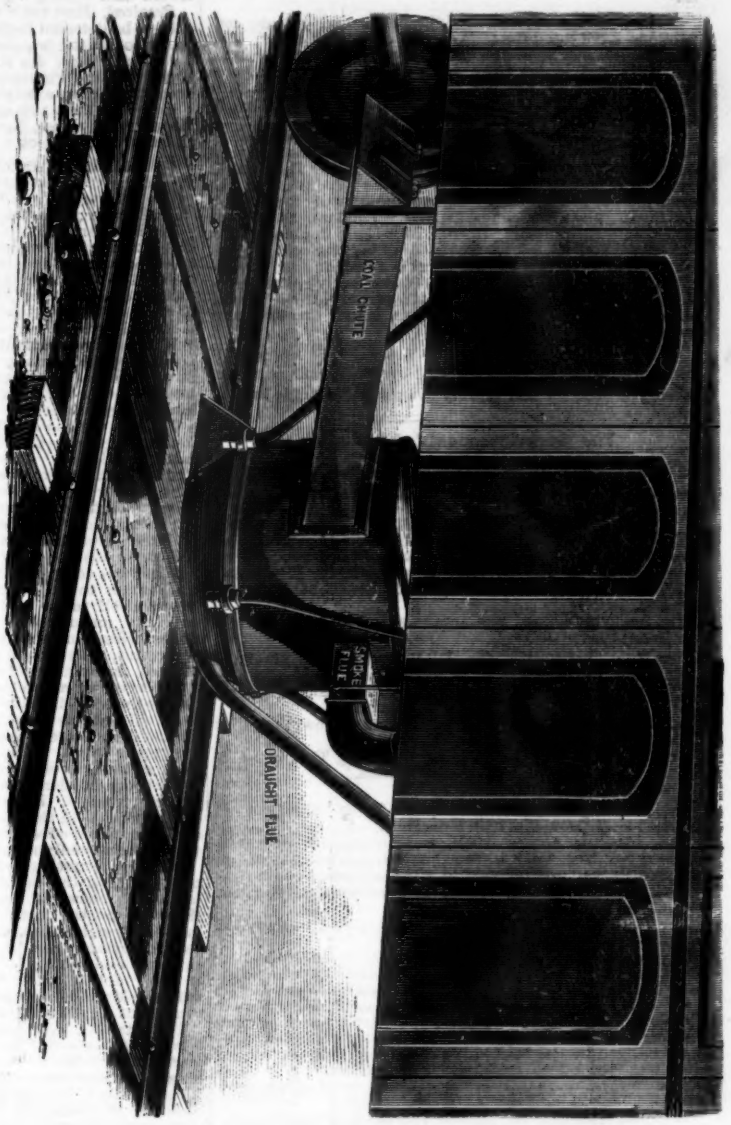

Fig. 1.

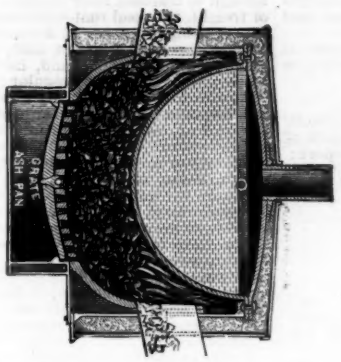

Fig. 3

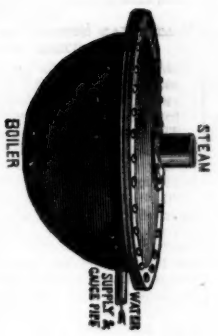

Fig. 4.

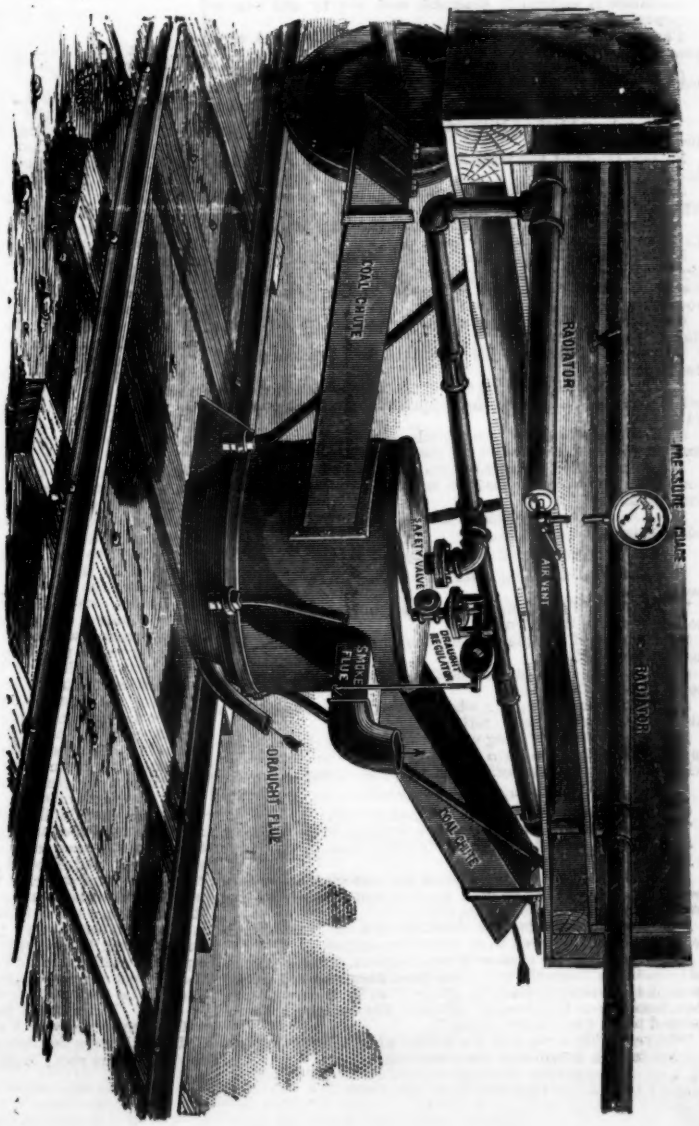

Fig. 2.

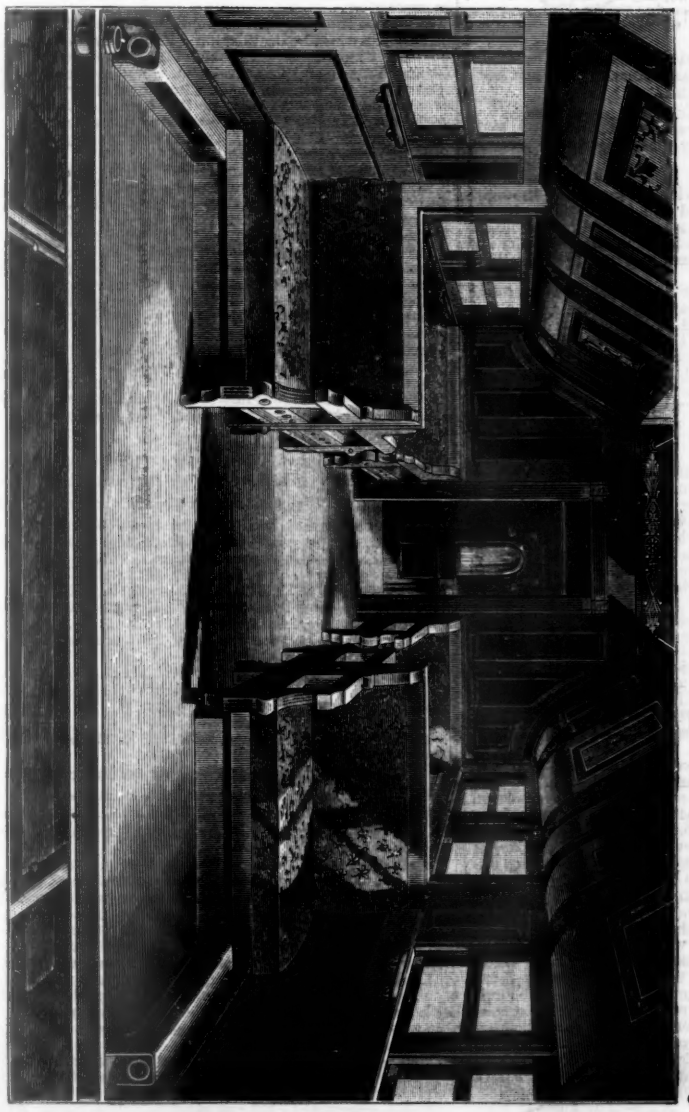

Fig. 5.

Central & Hudson River Railroad, and the inventor says of it:

"The thorough protection of the boiler and outside connections have stood the tests of the coldest weather, high winds and heavy snow-storms. Snow and icicles have hung for days and nights over every part of the boiler, coal chutes, etc., with the fire burning steadily, and the heat within the car evenly maintained at a temperature of 70 degrees.

"It does not require the attendant to get under the car more than once or twice within twenty-four hours, and then only for the purpose of raking down the fire. The coal is supplied from the outside, without loss of time, by the brakeman or station-man while standing upon the station platform. The grate can be cleared of clinkers, as well as ashes, without deadening the fire, as it has a double motion of rocking and dumping. The labor of lugging coal up the car steps and through the car doors is avoided; and the accumulation of ashes and cinders is conveniently got rid of by dropping them on the track. With proper attention, say about three times within twenty-four hours, the fire need never go out."

This heater is manufactured by the Baker Car-Heater Company, No. 92 Liberty street, New York, and corner of Twenty-fifth street and Liberty avenue, Pittsburgh, Pa.

The Superintendents' Association.

The following is an abstract of the proceeding of the third meeting of this Association, kindly furnished by the Secretary, Mr. Waterman Stone:

The third meeting of the Association of American Railroad Superintendents was held at the rooms of the National Railway Club, No 46 Bond street, New York, on Wednesday and Thursday, April 19 and 20, 1882, President Randolph presiding.

The following-named gentlemen were elected members of the Association:

Wm. Mahl, Louisville, Cincinnati & Lexington.	J. W. Andrews, Midland North Carolina.
J. R. Kendrick, Old Colony.	Fred. T. Peet, Ithaca, Auburn & Western.
W. P. Harris, New York & Greenwood Lake.	F. S. Gannon, New York City & Northern.
J. W. Hobart, Central Vermont.	C. S. Gadsden, Charleston & Savannah.
A. J. Twiggs, Augusta & Knoxville.	

Honorary members elected were T. D. Kline, R. L. Walker, H. T. Douglass and Wm. Mahl.

The letter of Albert Allen, Superintendent Syracuse, Chenango & New York Railroad, relating to honesty of employés, was read and referred to a committee of one to report at the next meeting. Mr. J. B. Gardiner was appointed as that committee.

Mr. M. N. Forney, of the *Railroad Gazette*, was invited to take a seat in the convention.

Mr. Hammond, from the Committee on Train Rules and Signals, made a verbal report that they had not completed their labors and asked for further time and an expression of opinion on the part of members present as to the different signals in use. Mr. Forney having entered the room the consideration of the subject of train rules and signals was deferred, and he was invited to present his views as to the circular addressed to railroad superintendents by a committee of the Master Car-Builders' Association. Mr. Forney having complied with this invitation, it was

Resolved, That it is the sense of this meeting that the proposed change in the constitution of the Master Car-Builders' Association is eminently desirable and worthy the hearty approval of this Association.

The consideration of the subject of train rules was now resumed, and it was

Resolved, That the Association recommend to the committee to report at the next meeting the following signals:

Enginemen's signals, by whistle.

1. *One* short blast of the whistle is a signal to apply the brakes—stop.
2. *Two* blasts of the whistle is a signal to throw off the brakes.
3. *Two* blasts of the whistle when running is an answer to signal of conductor to stop at next station.
4. *Three* blasts of the whistle, when standing, is a signal that the engine or train will back.
5. *Three* short blasts of the whistle, while running, is a signal to be given by passing trains when carrying signals for a following train to call attention to the signals; and *four* short blasts is the answer to it.
6. *Four* long blasts of the whistle is a signal to call in the flagman or signalman.
7. *Four* short blasts of the whistle is the engineman's call for signals.
8. *Two* long, followed by two short blasts of the whistle when running, is a signal for approaching a road crossing at grade.
9. *Five* short blasts of the whistle is a signal to the flagman to go back and protect the rear of the train.
10. A succession of short blasts of the whistle is an alarm for cattle, and may be used to call the attention of trainmen to danger.
11. A blast of the whistle of five seconds duration will be considered as a long blast.

Conductor's signals, by bell-cord.

1. *One* tap of the gong when the engine is standing is a notice to start.
2. *Two* taps of the gong when the engine is standing is a notice to call in the flagman.
3. *Two* taps of the gong, when the engine is running, is a notice to stop at *once*.
4. *Three* taps of the gong when the engine is standing is a notice to back the train.
5. *Three* taps of the gong when the engine is running is a notice to stop at the next station.

☞ One tap of the gong when running will be regarded as a warning that the train has parted, and the engineman will follow the rule prescribed for that emergency.

A Lamp, Hat, or Hand.

6. Swung across the track is a signal to stop.
7. Raised and lowered vertically is a signal to move ahead.
8. Swung in a circle is a signal to move back.

It was

Resolved, That in the opinion of the Association two or more colors should not be used upon locomotives of leading trains as a signal for following trains.

Resolved, That the further consideration of train signals be deferred and referred back to the committee.

Resolved, That the system of gong siguals, whistle signals and conductor's signals, which has been discussed and passed upon at the April meeting, be adopted as in the opinion of the Association the proper one, and the members be requested to conform to the same.

Resolved, That a copy of the preceding resolution be forwarded to each member of the Association.

Mr. Sully, from the Committee on Car Exchange, presented their report, whereupon it was

Resolved, That the consideration of the subject of car exchange be deferred to the next meeting, and that the report of the committee be printed and a copy sent to each member.

Resolved, That the thanks of the Association be extened to the Railway Publishing Company for the courtesies and accommodations extended to the Association.

Resolved, That this meeting do now adjouru to meet at No. 46 Bond street, New York, on the third Wednesday in October, at 10 o'clock a. m.

REPORT OF COMMITTEE ON CAR EXCHANGE.

To the Association of American Railroad Superintendents:

The undersigned, to whom was referred the subject of "Car Exchange," respectfully submit the following report:

The inauguration of a systematic method of conducting this branch of the railroad service, the committee believe to be of vital importance, and worthy the earnest consideration of the Association, and, notwithstanding the many difficulties to be overcome, difficulties to which they are fully alive, they believe that a system can be devised which shall ultimately receive universal approval and adoption.

With a view of stimulating a free discussion of this important question, rather than with the conviction that they have succeeded in solving the vexed problem, the committee present for the consideration of the Association the following suggestions:

The best method of determining the compensation for the use of freight cars they believe to be the adoption of a fixed rate per mile run. This rate should be universal, and at a figure which, without being onerous to those using foreign cars for through business, will yet be high enough to be a check upon their local use.

This question of the letting of freight cars, the committee believe to be a purely business one, and subject to the same interpretation and rules as any other business transaction.

When one company allows its cars to be used by another, and agrees to receive a certain price for this service, it places itself in the position of a lessor; and if the second company, under a press of business, elects to lease the cars at the price demanded, the lessor has no serious cause for complaint, even though occasionally, under certain circumstances, the arrangement does not result to its advantage.

The most serious obstacle to the prompt return of freight cars is their illegitimate use as store-houses by consignees at terminal stations (though it may be doubted if the initial station is not more or less to blame); and this is a grievous evil, upon which prompt action is required; so long, however, as the laws of certain states will not permit of the legal collection of demurrage, no universal rule can be adopted. The correction of this abuse, then, should begin by an intelligent effort with the state legislatures, after which a united and determined effort on the part of the railroad companies would undoubtedly accomplish the object desired.

For the accounting and collection of car mileage, the committee suggest the establishment of clearing-houses similar to that in successful operation in New England. These should be, as the name implies, *clearing* houses, and the monthly freight mileage balances should be settled through them. Instead, then, of treating with a large number of railroads and settling for amounts varying from a few cents to many dollars, each company will have to deal simply with the Manager of the Association, for whose accuracy a competent auditing committee should be responsible.

The details of these associations need not be entered into here, as they are ably and elaborately described in the communication of Mr. E. B. Hill, Manager of the New England Clearing-House Association, accompanying this report.

The thanks of the committee are due to Mr. Hill, and also to Mr. C. W. Cushman, Manager of the Railroad Car Association, for valuable suggestions.

WATERMAN STONE,
L. W. SANDIFORTH,
R. M. SULLY,
} *Committee.*

THE NEW ENGLAND CLEARING-HOUSE ASSOCIATION.

The following is the letter referred to from Mr. E. B. Hill, Manager of the "Railway Clearing-House Association," dated March 4, 1882:

DEAR SIR: As the originator of what is known as the clearing-house system of car service accounts, and the manager of the institution established under that system by the New England railroad companies, it would be natural to expect from me an argument in favor of that system, and this I take to be the object of your letter of late date, asking my ideas on the subject.

Car mileage accounts present one peculiarity not found in any other department of the railway service. Let a corporation operating one hundred miles of road employ a fourth-rate clerk at a low salary to take charge of these accounts, with a slack and inefficient system, or what had better be called no system at all, and the chances are that that corporation will be the gainer, and the roads that send cars on their line the losers. If conductors fail to report a car here and there, or perhaps make no report at all; if agents are slack or careless with their reports and there is no way of checking the errors or omissions, the amount to be paid for the use of cars will be materially reduced. Knowing this to be so, the railroad companies that have a *good* system of accounts, and scrupulously pay what they owe, feel that they ought to have some means of knowing whether they are being paid what is due them from the roads using their cars. How this can be best accomplished, is, I take it, what your committee wishes to ascertain, with some means of preventing the detention of cars and their illegitimate use.

I believe the only practicable solution of this question will be found in the extension of the system which has been adopted by the New England roads. By a system of clearing-houses, established at convenient points, embracing the entire country, organized under uniform rules, every railroad company will know what is being done with its cars, that every mile they run is paid for, and by mutual agreement as to penalties to be exacted, the illegitimate use of cars can be effectually prevented.

During the past four years I have had charge of the car-service accounts of some forty railroad companies, owning 40,000 cars, and operating 6,000 miles of road, in a section of the country where the local traffic is immense, and where the temptation to use the cars of foreign roads illegitimately is at times very great, and I believe, therefore, I can speak with some authority on this subject. My experience has shown me that the illegitimate use of cars is *universal*. As a representative of the New England roads, I am well aware that stones thrown into our territory would be apt to break some glass, but I want to see the "Western" man that throws the first stone. I think he will find his domicile composed of material equally as brittle as ours. "They all do it." Some are worse than others, but I do not believe there is a road in the country that is exempt from it, and the evil will exist until a general showing of hands is agreed to, and a penalty inflicted which will be heavy enough to make it for the interest of every railroad company to build cars enough to carry on their local traffic and let the cars of other roads go home. But without the showing of hands, building cars will not cure the evil. A and B are two well equipped roads. C, D and E have not cars enough. A frequently has to load one of B's cars away from home because C, D or E has its (A's) cars running in local service. Now if A, B, C, D and E form a clearing-house and agree that if a car is used illegitimately, the offending road shall pay the owner five or ten cents a mile for it, how long would C, D or E use A's or B's cars? They would find it for their interest to own cars enough to transact their business. In case of a sudden rush of freight, the road that was cramped would ask the privilege of using a number of A's cars at the regular rate of one cent, or three-fourths of a cent, a mile, which A would be glad perhaps to grant, and, having notified the clearing-house to that effect, the regular rate would be charged.

Now as to detentions. My experience here in New England has shown that a very large per cent. of the detentions are the fault of the initial station, the station from which the freight was originally billed. If the agent of the Lake Shore & Michigan Southern Railway Company at Chicago allows Smith, Jones & Co. to load a Lake Shore & Michigan Southern car with freight consigned "to order," or what is the same thing, to "Smith, Jones & Co., Boston," and that car is held here two or three weeks waiting for the consignee to be found, and when found, held till he has sold the freight, we are accused of detaining the car. A majority of the "outrageous detentions" of which New England roads have been accused, have no better ground to stand on than this. In my opinion, if the illegitimate use of cars in local service can be stopped, a remedy will soon be found for the "detentions."

To make the clearing-house what its name implies, the settlement of balances for car service should be made through it. The present method of settlement is a relic of the days of stage-coaches. I have devised a plan for making the settlements here in New England through this bureau, which has been submitted to and approved by nearly all of our companies, and I hope to have it in operation within sixty days. I inclose a memorandum giving a brief outline of the plan, which you are at liberty to use in connection with this letter, should you desire to do so.

Very truly yours,
E. B. HILL,
Manager.

WATERMAN STONE, Esq.,
Chairman, etc., etc.

Outline of Plan for proposed Settlement of Car-Service Balances through the Railway Clearing-House, subject to such Changes or Modifications as the Treasurers or Auditors may deem expedient.

The car-service accounts to be made up by the General Accountant of the Clearing-House, showing in detail the *mileage* and *amount* due *from* and *to* the railroad company, with the debit and credit balances. This account to be made in *duplicate*, the original to be receipted by the Manager of the Clearing-House, and held by the railroad company as its voucher for the payment of the sums due *to* the roads named therein. The duplicate to be compared with the original by the treasurer of the railroad company, and if found to be correct, to be receipted and returned to the Manager of the Clearing-House, and held by him as his voucher that the sums standing to the credit of that company have been paid. These duplicates, as will be seen further on, constitute a *perfect check* on every transaction of the Clearing-House.

The by-laws of the Clearing-House Association provide for the appointment of three auditors, whose duty it will be to examine the accounts of the Clearing-House as often as once in three months. It is proposed that no *three* persons shall hold the office of auditor two years in succession. At the end of the year at least *one* will go out, and be succeeded by a new man; the idea being to prevent any laxity or carelessness on the part of the auditors which might occur if these individuals were retained in office a number of years in succession.

It will be the duty of these auditors to give the settlement of balances a rigid examination. The duplicate copy of the monthly accounts herein provided for, bearing the certificate of the Treasurer of the railroad company, must and *will* show every transaction of the Clearing-House with each and every road; and with these in the hands of the auditors, with the Manager's check-book and returned checks, a fraudulent or illegitimate transaction of any kind will be detected with absolute certainty.

The present auditors are Messrs. M. E. Barber, Auditor Boston & Albany Railroad Company; E. C. Robinson, Auditor New York, New Haven & Hartford Railroad; and James Daily, General Ticket Agent and Auditor Boston & Providence Railroad Company, all well-known gentlemen, whose faithfulness and integrity no one will question.

In order to dispose of the accounts with Western roads, or roads outside of New England, a circular should be issued instructing them to send the car-service reports, as heretofore, to the Auditor or Chief Clerk, but instead of remitting to the Treasurer as heretofore, to remit to the Clearing-House, or, if, as is customary with many of the Western roads, they do not remit, preferring to settle by being *drawn upon*, in nine cases out of ten the amount can be deducted from the balance due them from the Clearing-House, and will be taken up in the account and placed to the credit of the road to which it belongs.

Form of Certificate on the "Duplicate" Statement of Account, referred to in the foregoing.

The above account has been examined by me and compared with the original now on file in this office, and I certify it to be a correct copy of the said original. I hereby acknowledge the receipt of the amount credited to this company, to wit.....dollars.....cents; (and I herewith enclose my check for.....dollars.....cents, in settlement of the balance due from this company to the several roads above named.)*

(Signed,).....
Treasurer.

Dated..... ....188-.

* Part inclosed in brackets to be left off of form for remitting a "*credit*" balance.

THE BUFFALO RAILWAY CAR ASSOCIATION.

Mr. C. W. Cushman, Manager of this Association, submitted the following, dated Buffalo, N. Y., Feb. 22, 1882.

MR. WATERMAN STONE, *Superintendent Providence, Warren & Bristel R. R. Co., Providence, R. I.:*

DEAR SIR: Your favor of Dec. 23 was duly received, but owing to my being on the sick-list at the time, and having so much on hand, I have not been able to answer before.

You ask me to give my views as to the best methods of settling car mileage, penalty for misuse of cars, and the benefits derived from such an association as ours.

Answering the first question on "car mileage," would say that, while we are but a car-tracing association, and have nothing whatever to with mileage, still I uphold the clearing-house system, and consider that plan the most practicable way for adjustment of mileage accounts, and for the following reasons:

First.—Because you know that you are receiving correct mileage returns for the use of your cars on foreign roads, which is an object, and a *large one* in the end.

Second.—Because of the extended facilities given you in knowing what your cars are doing on connecting roads,

whether being illegitimately used in local trade, or standing on some side track not fifty miles from home, with the grass growing up under them.

Third.—The monthly statement should give the result of each month's mileage business, which otherwise would require at the hands of bookkeepers and auditors a large amount of extra labor.

Fourth.—It should reduce the number of ledger accounts and the corresponding entries of debits and credits from 25 to 150 down to *one* account, and when the treasurer of each road is ready to draw upon the manager of the clearing-house for his mileage, besides being relieved from the burden of examining and adjusting numerous accounts, and from drawing or paying 25 to 150 drafts, he is necessarily only compelled to pay one, and that is the end of it.

Fifth.—The manager of the clearing-house should have *full authority* to order stopped the misuse of cars on roads where they are being used in local service, through the proper official, and owners should be notified of any such abuse to their cars; this would put a stop to the present illegitimate use of cars on nearly all the roads in the country, and if they did not live up to the rules they should be held *strictly accountable by their neighbors*, who should be notified of the fact at once. The manager should have his car records up to within 24 hours of date, and not later than 48 hours, in order to give perfect satisfaction to the roads he represents. Orders for the return home of foreign cars should be made by him *direct through the superintendent whose division the cars are on.*

In regard to our Association, at this point would say that we are authorized by the roads forming this organization to look out for their cars after they leave their own line of road, and wherever they are being detained or misused it is our business to request their immediate return home, and we also notify the owners at the same time. We handle from the forty roads at present in the Association, nearly one thousand eight hundred daily reports, which are tissue copies of all the original car reports. *First*—Junction reports of cars forwarded to and received from connections. *Second*—Station reports showing arrival and departure of all cars at *all stations* in train. *Third*—Detention report showing all cars remaining on hand at 6 p. m., each day, stating whether loaded or empty. *Fourth*—Shop report of cars going in for repairs and coming out. Our records are made up from these reports, which enables us to locate the different company's cars. Herewith inclosed I send you samples of the reports we send out, so that you may get an idea of what is done. If there is any thing that I have omitted on this subject please advise, and I will most willingly give it to you.

I am yours very truly,
C. W. CUSHMAN, Manager.

The British Railway Commission on "Discriminations."

The following selections from the annual report of the British Railway Commission for 1881 give in full the Commissioners' statement of the cases they have decided involving "discriminations," and will be more intelligible than the briefer accounts of the same cases given in the abstract of the whole report which we published April 21:

7. The second part of Section 2 of the Traffic Act, 1854, applies to the mode in which a railway company treats its different customers relatively to each other, and the general nature of the question in the cases which fall within it is whether, in the terms in which a company carries for persons traveling or sending goods by its railway, it makes any distinction which amounts to an undue preference or prejudice. In Richardson and others *vs.* the Midland Railway Company (App. 1., No. 6) the contention was that the terms on which the company carried brewers' traffic at Newark, principally beer, malt, hops, barley and staves for casks, were so unfavorable, as compared with the corresponding terms at Burton, as to subject the company to the consequences of a non-compliance with the provisions of the Traffic Act. It was no answer to say that the places were not the same; for, as to that, regarded as a circumstance in a case, or as affecting the obligations under the act, there was the authority of the Common Pleas for holding that the footing on which a case stood was not altered by the charges compared being for the carriage of traffic to and from different places, and not of traffic all going to and from the same place. The advantages given to Burton traffic were, reduced rates of carraige per ton, a computed weight to the ton for malt and barley, equivalent to carrying a quarter of grain for every ton gratis, and the application of the tonnage scale of charges instead of the higher "small packages" scale to consignments of beer under 500 lbs. weight; and it was maintained by the railway company that these advantages were no more than a fair consideration for those which they received from the Burton breweries in return. They referred to the larger quantity of the Burton traffic, to the easier conditions to the carrying company under which it was handed over for conveyance, to the greater length of its journeys by railway, and to the heavier average weight of its wagon loads. The effect on working expenses was, they found, that the lower rate on Burton traffic was as remunerative to them as the higher rate on the Newark traffic, and under these circumstances they denied that they gave any undue advantages to the Burton traffic, or that the distinction between the Burton and Newark rates was one that might not legitimately be made. We concurred, in the main, in their reasoning, but at the same time were of opinion that there was a considerable part of the traffic and rates in question to which it did not apply. It did not apply, we thought, to consignments of goods not exceeding 500 lbs. weight, nor to traffic inwards, as malt and barley. Nothing was shown from which it could be inferred that there was more expense or trouble in carrying Newark traffic of those kinds than similar Burton traffic, and we directed, therefore, that in those respects the company should discontinue the distinctions which were the subject of complaint.

8. The City of Dublin Steam Packet Company *vs.* London & Northwestern Railway Company (App. I., No. 9) was a complaint of the through mail fares between London and Kingstown, *via* Holyhead and the City of Dublin steam vessels, as fixed by the railway company, being higher than the through fares the railway company charged between London and North Wall, Dublin, *via* Holyhead and their own North Wall steam vessels, and of the difference between the fares causing an undue prejudice to traffic by the mail route. The first and second-class fares between London and Dublin by the mail route were 60s. and 45s., and by the North Wall route 47s. 6d. and 36s. 6d., and it was alleged that these unequal charges were maintained by the railway company to promote their competition at sea with the applicants, and to enable them to conduct it successfully. The services themselves do not differ in quality. There were indeed no facilities by the mail route that were not equally to be enjoyed by the North Wall route. Each route had one morning and one evening departure each way, trains and steamers working in connection, the same class of steamers, that is to say, boats reserved for passengers exclusively and not cargo or cattle boats as well, and an express rate of speed throughout the transit; the journey, however, by the mail route being the quicker one, and occupying an hour and a half less time than the journey by the other route. In nearly all respects, therefore, the two services were equally good, and being so, it was natural that the less expensive of the two should be preferred and should attract and draw off traffic from the other; and, as a matter of fact, from 1876, when the North Wall steamers first commenced running as a competitive passenger line, the annual receipts from passengers by the mail steamers continually declined, falling from £50,000 in 1874 and 1875 to £33,000 in 1880, and by the North Wall steamers as regularly increased, rising from £8,000 in 1876 to £20,000 in 1880. By a contract between the companies the railway company had power and liberty to fix the through rates by the mail route as they might think proper, paying a mileage proportion of the whole receipts to the Dublin Company for the sea transit, and the consequence was that, as far as fares were concerned, the Northwestern Railway Company had as complete control over the postal route as they had over any route of which they were exclusively owners, and that the exercise of that control was subject to the same obligations as to charging equally and reasonably as if the route had been their own. The Railway Traffic Act, 1854, was extended by statute to the steamboats of both companies, and we decided that the fares of the mail route, having regard to the fares by the alternative route, were excessive, and an undue prejudice to traffic, and we granted an injunction against the continuance of the inequality. But the Dublin Company asked also for an order for through rates. They proposed that through fares by the mail route should be the same as the fares charged by the Northwestern Company for the North Wall route, and should be granted at those amounts as through rates under the Act of 1873. For reasons we will presently notice we held that the Dublin Company were disentitled to propose through rates, and that their request must be refused.

9. Another case upon the subject of undue prejudice was the Denaby Main Colliery Company *vs.* the Manchester, Sheffield & Lincolnshire Railway Company (App. I., No. 16). The railway company were the owners of canals connecting the South Yorkshire collieries with Hull and the Trent at Keadby, and were authorized to charge tolls for the use of the canals. The authorized tolls were of various amounts; but the maximum payable upon coal was one halfpenny per ton per mile. All the South Yorkshire collieries had the means of sending to Hull by railway; but at least half the quantity of their coal for Hull went by canal, and all the collieries were charged a uniform toll of 1s. 1½d., with the exception of Denaby, which was charged a halfpenny less, and the contention in the case was that, having regard to the differences in distance and other respects between Denaby and the other collieries, the toll to Denaby ought to be more than a halfpenny lower. Previously to 1876 a difference, having reference to distance, was made in the tolls, and the toll to Denaby was then from 1½d. to 3½d. lower; but in that year all other tolls were equalized and reduced to the same amount as the toll to Denaby, with one halfpenny added. There was no doubt that in the case of water carriage different lengths might be used, and the circumstances be such to mere toll-takers for the use of the way, as to make it no ground for complaint, if no less charge was imposed for the shorter than for the longer distance. There was, however, as it seemed to us, such a distinctive character in the situation of Denaby in relation to the canals of the railway company, as compared with that of all the other collieries, as to make it fair and reasonable that some such distinction in the amount of its toll as had been recognized by the railway company previously to 1876 should continue to be made, and we ordered that the toll to Denaby should be kept in about the proportion of 12d. to 13½d. to the tolls of the collieries higher up the canal than it.

10. J. & J. Colman *vs.* the Great Eastern Railway Company was also a case of undue prejudice. The works of the applicants are within a short distance of Trowse station, near Norwich, and are connected with the company's railway by sidings, which are the property of Messrs. Colman. The haulage on these sidings to and from their works, and the loading and unloading of trucks, are done by the applicants, and the railway company take the loaded wagons to and from the sidings. The applicants send a large traffic by the Great Eastern Railway to stations on the lines of other railway companies, and since the beginning of 1876 this outward through traffic has been carried at through rates. These rates were, it was said, collection and delivery rates, and included payment also for station services; and, inasmuch as the applicants did all collection or cartage at Trowse station themselves, and had no terminal services performed for them by the Great Eastern Company, they disputed the right of the company to charge them the whole amount of the through rates, and contended they were bound to make a rebate or deduction from them. In addition to the through traffic they employed the company to carry local traffic or their traffic from Trowse station to other stations on the Great Eastern Railway, and part of their application was for an order upon the railway company to distinguish in their rate books at Trowse station how much of their rates for the carriage of this local traffic, which the applicants alleged to be in excess of the rates the company were authorized to charge, was for conveyance on the railway, and how much for other expenses. The railway company denied by their answer that they had subjected the applicants' traffic to any undue prejudice in respect of collection or station services, and submitted also that no order could or ought to be made to divide the rates in the rate books as applied for. They did not, however, resist the application when it came on for hearing (Nov. 29, 1881), and we made an order by consent according to the following agreed terms: "An allowance in future of 2s. per ton to be made to applicants for cartage and terminal services on the through C and D rates. The deduction of 1s. 6d. in the past to be accepted as a settlement by both parties without further claim, company to consent to an order to distinguish the local rates (*i. e.*, rates between two Great Eastern stations over Great Eastern line) in accordance with section 14. Applicants to have their costs, to be taxed in the usual way." It may be stated that it would not have been possible for the company to deal with the applicants' traffic at the Trowse station, which as a goods station was quite insufficient to accommodate any considerable quantity of traffic.

The Railroads and the Government of Canada.

A correspondent writes as follows to *Herapath's Railway Journal:*

At the shareholders' meeting of the Grand Trunk Railway, held last week, a proposal to lease the Great Western of Canada was made, and, to judge by the speeches, one would suppose that the railways were worked for the exclusive benefit of the Canadians, who had treated the English capitalists and investors interested in those railways with much ingratitude. This is growing to be the popular opinion among Canadian railway shareholders in England; therefore its injustice should be explained. In the first place, the Canadian government has never attempted to interfere with the tariffs of the railways; therefore, if they carry traffic at unprofitable rates, it is simply their own faults. There has never been a manager of either the Grand Trunk or the Great Western who was not an Englishman, selected and sent out by the English boards of directors of both companies, to whom alone they have been responsible. The management, therefore, cannot have suffered from Canadian interference. Now let me point out what assistance Canada has given to the two railways mentioned. To assist the construction of the lines, the Canadian government advanced to both companies money on mortgage at 6 per cent. interest. The Great Western paid their interest for a short time, but then stopped paying altogether, eventually compromising the balance due by paying interest at the same rate as they had paid dividend to their own shareholders, which was about half the rate they had agreed to pay. The Grand Trunk never paid a farthing of either principal or interest, and at the present time owe the government three millions sterling with compound interest for more than 20 years; but a few years ago the government, to assist the company, allowed their mortgage loan to rank after the Grand Trunk common stock, then selling at £6 for the £100. More recently, to help the Grand Trunk to acquire the Chicago branch, the government purchased from them the known to be unprofitable Riviere du Loup Branch. This is a summary of the ingratitude of the Canadians. Now the Canadian Parliament is to be asked to consent to legalize the lease of the Great Western to the Grand Trunk, thus virtually placing in the hands of one company the whole railway system of the colony—when this is refused, as it most decidedly will be, there will arise a cry against Canadian injustice; but is such a charge right or fair? Would any country in the civilized world submit to such a monopoly as this would create? To bring the matter home in a much smaller degree, would even Sir Henry Tyler vote in the British Parliament for a lease of the Midland to the London & Northwestern: such a proposal would scarcely be listened to. Yet, with a much smaller chance in the case of the Canadian lines, the Great Western shareholders are asked to turn out their board, elect those who are willing to do the bidding of the Grand Trunk, and depend upon a lease to be legalized in eighteen month's time—meantime I should like to know what would become of their connections of the past thirty years. On June 1, 1883, the Great Western would doubtless be in this position, their old connections destroyed, and no legal power to lease. No doubt those upon both boards who understand Canada know this; therefore the Grand Trunk might as safely have offered 10 per cent. guarantee as 3, for all the chance there would be of ever carrying it out. At the same time, I think they are mistaken if they think the merchants of Canada will abandon their second outlet from Montreal to the West. They have bought the line from Montreal to Ottawa as a step in that direction, and they intend to finish it to Toronto this summer.

Transportation in Congress.

In the Senate on the 20th:

Mr. McDill, of Iowa, addressed the Senate upon the regulation of inter-state commerce—the bill introduced by him creating a Board of Railway Commissioners on the subject being informally taken up. The bill prohibits unjust discriminations in rates and charges either against persons or places, as also extortions and secret arrangements through concessions, special rates or drawbacks of any kind. The commission is to consist of a civil engineer, with practical railroad experience, a shipper largely acquainted with the shipping interests, and a specialist, who has studied the railroad problem, or one of approved legal ability. The commission is to carefully study and gather statistics upon the transportation problem, to require from all railroad and transportation companies engaged in inter-state commerce annual reports and specific answers to all questions deemed by the commissioners of importance to the inquiry, and to specially consider the cases of hardship with regard to inter-state commerce laid before it by State Commissioners. The bill requires the commission to report the facts to Congress, and to advise delinquent corporations as to what should be done to remedy the evil complained of, and if these refuse to comply with its advice, their refusal is to be reported to Congress for action.

Mr. McDill spoke at some length in explanation, and at the close of his remarks the bill was referred.

In the Senate on the 25th:

The Mississippi River improvement bill was passed as reported, all amendments having been withdrawn. It provides that the Secretary of War, with the advice and under the direction of the Mississippi River Commission, shall expend $5,000,000 on the Mississippi and $1,000,000 on the Missouri in deepening the channels and improving the navigation of those rivers, etc.

In the House on the 25th:

A bill was passed authorizing the Sioux City & Pacific Railroad Company to construct a railroad bridge over the Missouri River north of Omaha.

Old Buffalo Railroads.

In a historical article on the city of Buffalo the Buffalo *Express* has the following concerning the railroads:

"The Buffalo & Niagara Falls Railroad, 22 miles long, was constructed in 1836 and opened for business in 1837, with a capital stock of $150,000. Its officers were: President, P. B. Porter; Secretary and Treasurer, W. A. Bird; directors, P. B. Porter, David Burt, Isaac S. Smith, David E. Evans, A. Porter and Stephen White; superintendents, Isaac T. Hathaway, George P. Stevenson. When, in 1853, the several railroads comprising the line between Albany and Buffalo were consolidated into the New York Central, that road leased the Buffalo & Niagara Falls; and by act of the Legislature, passed in 1855, this road became practically consolidated with the Central. The original line from Buffalo to the Falls, which was for nearly the whole distance within the limits of the traveled highway, was thereupon abandoned, the track of the Buffalo & Lockport being used from Buffalo to Tonawanda, and the track of the Niagara Falls & Canandaigua for the rest of the way. In 1832 the State Legislature incorporated the New York & Erie Railroad Company, with authority to constructed a road from the Hudson River to Lake Erie, but the road did not reach Dunkirk till 1850, and upon Buffalo's birthday as a city much of the southern tier was a howling wilderness. The old Lockport & Niagara Falls Railroad, chartered in 1834, was opened in 1838, horses furnishing the motive power. It subsequently became the Rochester, Lockport & Niagara Falls, and is now a part of the Central. Even after Buffalo had rail communication with Albany the journey thence to New York was long and tedious. The train which left Buffalo at seven in the morning reached Rochester at one in the afternoon, and Syracuse at nine at night. Sleeping-cars were undreamed of; comfortable seats were not devised; baggage-checks were not invented. The road was rough and poorly ballasted, changes of cars were frequent, and baggagemen and stage drivers extortionate. There have been no good old days in railroading. The modern times are best; the future will be best of all."

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

DRAWING-ROOM CARS.

That a considerable proportion of the people who travel value cleanliness, decent manners and superior comfort has long since been recognized in this country as well as in Europe, and also that in both continents they are willing to pay for such environments. In the old country the accommodations furnished are called first, second and third *class*, indicating a difference in the passengers as well as in the "carriages," whereas here it is only the superiority of the cars that can be recognized. It has therefore been necessary to establish some factitious or conventional distinction between the cars for those who are willing to pay for some degree of exclusiveness and comfort. Two devices were chosen some years ago as the ostensible basis of distinction between ordinary passenger cars and those for the accommodation of people who seek exclusiveness. These devices were arm chairs and big windows. Some extra upholstery was thrown in, but generally, beside the exclusiveness, what the drawing-room car passenger paid for was to ride in an uncomfortable chair and look out of a big window, which, to at least one half of the passengers, was most inconveniently located. It might hastily be inferred that a discerning public would soon refuse to spend money for such considerations, but, besides the fact that under republican institutions some measure of social distinction is attainable by any one, and therefore that all struggle for it, there are other reasons why many experienced travelers are willing to incur the additional expense of journeying in arm chairs, and looking through a big instead of a small pane of glass. These reasons can be set forth best perhaps by resorting to a more or less personal narrative, detailing the experience of the writer during a recent journey.

The latter was from New York to Baltimore, and a seat was engaged in a Pullman palace car to Philadelphia, the journey being divided up into two parts. The chair assigned to the writer was near the middle of the car, and was as uncomfortable as a convexly upholstered seat could well make it, and the window was placed so that it was impossible to see out of it with comfort. There was no room for a somewhat large traveling bag, nor any rack for coat or packages. The chairs were placed in such a way, in relation to each other, that it was difficult to dispose of one's feet and legs with comfort. These luxuries cost fifty cents.

After remaining in Philadelphia for a day, the remainder of the journey, from Philadelphia to Baltimore, was completed. Fifty cents was again invested, but this time for purposes of comparison. The only chair obtainable was one at the extreme front of the main compartment of the car opposite the passage way leading to the door. The same discomfort in the seat and arrangement of windows was again experienced. There was no place for the traveling bag, and legs and arms for the time assumed the characters of inconvenient appendages. Besides, the car was the second one on the train, and those persons who had sensitive nerves were disturbed by the frequent howling of the locomotive whistle. Every time the front door was opened a draft of air suggested sneezes, a cold in the head, or sore throat.

During the stop at Wilmington, it was noticed that there were several of the ordinary cars, built by the Pennsylvania Railroad, of what is called the "Eastlake" design, on the train. The writer therefore went into one of these, and completed his journey in it. The seat was in every respect more comfortable than the chair in the other car. There was more room in it, the upholstery was better adapted to the shape of a passenger's body, it permitted of a change of position, and there was room enough between the seats for the lower extremities of a passenger. The window was so placed that a traveler could conveniently look out of it. There was more seclusion, and less personal propinquity with adjoining passengers than in the other car. The Eastlake design and light wood gave a finish that was by far more pleasing than the elaborateness of the drawing-room car, and altogether there was far more comfort in the one occupied last than in the one in which the journey was begun. So much was this the case that the impression was irresistible that the railroad company was making a mistake, and was charging extra for the wrong vehicle; in other words, that if the chairs were made free, and an additional sum was collected for the privilege of occupying one of the seats in the Eastlake car, the arrangement would be more nearly equitable than it is now.

Such being the case, it will naturally be asked, why under the circumstances, is anyone so absurd as to waste money on chairs and big windows. The narration of a little experience on the return journey may, perhaps, answer this. It was made direct from Baltimore to New York, and with the light of previous experience the writer concluded to save a dollar, and travel ordinary. From Baltimore to Philadelphia he had the satisfaction of occupying a delightfully clean, cheerful and pleasant new car built by the Pennsylvania Railroad Company. It is not necessay to dwell on the agreeably cool effect produced by the light wood finish, the olive plush coverings of the seats, the chocolate and gold head-linings, and the tasteful gilt lamps and other furnishings. In the language of the æsthetes it was "consummate," and having in mind the name of the designer, it would seem more proper to call them Elysian instead of Eastlake cars. All this comfort was enjoyed with the consoling reflection that it was combined with the economy of one dollar. At Philadelphia, however, the pleasant dream was dissipated. It was then announced that we must "change cars," and the luckless passengers were marshaled into one which ran through to Boston, and which is the property of the New York, New Haven & Hartford Railroad Company. It was old, dingy and dirty. Of the w. c. it could truly be said that "it stinketh." The fires had been built for some time, and when the passengers entered, the temperature was about 125°. The brakeman informed them that there was no ventilation, and that the windows must be opened, a direction not easy to obey without using a crow-bar in some instances. Some of the window-latches were broken off and would not hold the windows up when they were raised. The clear-story windows were fixed, although there were some useless ventilators with gratings to obstruct the free flow of air in the clear-story. There were also ventilators over the end windows, but the one at the back end was immovable. To the credit of the brakeman, be it said, he opened all the windows and ventilators that could be opened and the back door. After the train was in motion a short time, the windows were closed, but one of the front end ventilators in front of the stove and the back door were kept open. This gave reasonably good ventilation for a time, until the fire in the front stove became low, when some of the passengers objected to the cold air from the front ventilator, which was therefore closed, and the supply of fresh air was shut off. The atmosphere soon became fetid, and odors of whisky and onions rolled in billows from end to end of the car. It is needless to say that it was not with unmingled satisfaction that the writer regarded the fact that he had saved a dollar, and he was also convinced that it is to escape such horrors as those described that a considerable proportion of people are willing to pay extra, even though their seats are wretchedly uncomfortable and their windows are placed for some quite different purposes than that of seeing through them.

Before finishing this branch of the subject, for the sake of being specific, we will say that the New Haven car which has been anathematized was No. 158 that it was attached to the train which left Baltimore at 3 p. m. on Monday, April 24.

There are two theories on which its disgraceful condition can be accounted for; one is that the New Haven Company thinks that kind of car is good enough for Yankees to travel in, the other theory is that they think it is not good enough, and therefore send it south. If the former hypothesis is the true one, the Connecticut Legislature should order its Railroad Commissioners to make an investigation of the condition of the cars on that line, and report whether they are not liable to breed infectious diseases; if the latter supposition is correct, the Pennsylvania Railroad Company should disinfect such cars before it receives them.

Abandoning this digression, though, it may be said that what people who travel in drawing-room cars are willing to pay for, is some measure of exclusiveness which will separate them from dirt and from people who drink whiskey and eat onions simultaneously, and who despise personal cleanliness generally. The people who belong to the drawing-room car caste—or some of them at least—like pure air and do not want to be exposed to extremes of heat and cold; they rejoice in a comfortable seat, and feel a satisfaction in knowing that when they pay for one it will be reserved for them. One of their chief pleasures in traveling is to look on the ever changing landscape, even though it is marred by wretched advertisements of miserable patent medicines, as it is in New Jersey. Cleanliness is their habit, and dirt and the New York & New Haven cars they despise. It is a fact which has been developed after some thousand years of experience in every civilized country in the world, that there are many people who dislike propinquity with some other people, and in travel this feeling manifests itself by the willingness which some will incur additional expense to escape contact with the others. All these are reasons why drawing-room cars are sought and patronized as they are. What we want to point out here, and will elaborate in a future article is, that cars of the ordinary plan which are as good as those now built by the Pennsylvania Railroad Company, would supply the wants of the class who now use the chair-cars better than the latter do, if reserved seats were sold in the former as they are in the latter; and we venture the prediction, that if the experiment were fairly tried, and if through cars of the ordinary pattern as good or better than those used on the Pennsylvania road were placed on the through trains between New York and Boston or Washington, they would eventually drive away the chair-cars, which, as built at present, are a humbug and delusion.

The Wabash, St. Louis & Pacific.

The Wabash, St. Louis & Pacific Railway has grown so fast within the past three years that it is not easy to get a definite idea of its progress by comparing the report of 1881 with that of previous years. At the close of 1881 it was working 3,348 miles of railroad, not in one or two long trunk lines with branches to the country adjacent, but in *thirty-three* different lines, including such various ones as a road from Toledo to St. Louis, one from St. Louis to Kansas City, one from St. Louis to Omaha, one from Chicago to St. Louis, one from Danville to Cairo, etc., everywhere crossed and entangled with other roads. One year earlier it had but 2,479 miles of road; at the end of 1879, 1,915 miles; and the two companies from which it was formed had 1,277 miles at the end of 1878. The road is a very different thing now from what it was two years ago or even last year, and as the traffic and earnings are reported for the whole system, and not for its different members, it is not possible to trace the effect of the several great additions to the company's property.

And we will take occasion to remark here that in all the great consolidated railroad systems, even though they do not grow fast when once made, it is becoming almost impossible for stockholders or others to trace the effect of the policy of their managers in particular directions, owing to the very magnitude of the undertakings and the custom of reporting their accounts as a whole only. What has been the result of the numerous acquisitions and extensions of the Chicago, Milwaukee & St. Paul in 1880 and 1881? We have no other means of knowing than is furnished by the traffic, earnings and expenses of the whole vast undertaking. What has been the result of the purchase of the Wisconsin Valley, the Chicago, Clinton, Dubuque & Minnesota, the Southern Minnesota, the

Sioux City & Dakota, and what of the numerous new lines in Dakota? How much have they earned directly, what has been their own traffic and how much traffic have they contributed to the older lines? We cannot even guess. The directors alone know the results of the policy they have adopted. And so with nearly every other great company. The Pennsylvania Railroad Company is an exception. It reports separately for each of its Western controlled and leased lines, and for the Philadelphia & Erie and the United Railroads of New Jersey. With some of the larger companies the reports, covering 3,000 to 4,000 miles of road, enable us to follow the course of traffic and production, to criticise methods and policies, little more than a report for all the railroads of a state does. When a company has built or bought a new road, its stockholders have a right to know whether the addition was profitable or not. If its system is small and simple, a comparison of the enlarged road with the old one serves very well, but if it has a system of 3,000 miles we cannot expect to trace the effects of a new line 200 miles long in that way; the fluctuations of traffic from year to year may be several times as great as the traffic of the new line. It may have been very productive, and yet the system as a whole show smaller profits, or it may have not earned its working expenses, and yet the system as a whole have great gains.

The Wabash Company, with an average of 2,625 miles of road worked in 1881, earned $14,467,790 gross and earned $3,674,846 net, against $12,428,112 gross and $4,640,763 net from an average of 1,942 miles in 1880. With an increase of 34½ per cent. in mileage there was indeed an increase in gross earnings (16.4 per cent.), but a *decrease* of more than one fifth in net earnings, and the latter were only $1,400 per mile of road, against $2,389 in 1880—a decrease of no less than 41 per cent.

There were potent causes for smaller earnings and profits in 1881. The rates of the 2,211 miles of the company's lines east of the Mississippi are governed to a very great extent by the trunk-line rates, and these were unprofitable for freight in both directions, and for passengers also nearly six months of the year. The low Chicago-St. Louis and St. Louis-Kansas City passenger rates made in the conflict following the opening of this company's Chicago line, the roads have never been able to advance, owing to the great number of unlimited tickets then issued. Worst of all, probably, was the failure of the grain crops, which afflicted most of the country through which the Wabash lines run.

A large increase of expenses was a necessary consequence of the vast increase in the company's mileage. The actual increase in expenses, however, was larger than that in mileage and very much larger than the increase in traffic. The latter was very large (40 per cent.) in passengers, as on most roads, but very small (4 per cent.) in freight, considering the increase of 34½ per cent. in mileage. Doubtless this large decrease of freight per mile was chiefly due to the bad crops, but it was also partly due to the fact that the additions to the system since 1880 generally have a very thin traffic. For instance, the whole system in 1880 had 570,000 ton miles and 50,340 passenger miles per mile of road—equal to 781 tons of freight and 69 passengers each way daily over the entire road; but one of its acquisitions, the Cairo & Vincennes, in the year ending June 30, 1880, had but 151½ tons of freight and 15½ passengers each way daily; the Danville & Southwestern, 99 tons of freight and 13½ passengers, while the Peoria, Pekin & Jacksonville, and the Havana, Rantoul & Eastern had a still lighter traffic. So much we learn from the reports of these roads to the Illinois Railroad Commissioners.

The new acquisitions all brought charges, however, and the interest and rentals increased $1,316,091, while the net earnings, as we have seen, fell off $965,917. The result was that the road failed by $1,142,120 of earning its fixed charges, and this condition was made worse by the payment of 6 per cent. on the preferred stock during the year, three-fourths of which, however, was supplied from the surplus of 1880.

That a company which paid dividends during the year should exhibit such a deficit as the result of the whole year's operations seems astonishing, and it naturally has had a very depressing influence on the price of this company's stocks. At the price ruling near the end of June last these were worth nearly $37,000,000; now $18,250,000 less. Such a change is the natural result of the discovery that the company earned but three-fourths of its fixed charges while it had been paying dividends.

The year 1881 was certainly an exceptionally unfavorable one for this road, but the causes which made it unfavorable were mostly effective only in the last half of the year, and these continue through the first half of this year. An immense improvement may be made in the last half of the year should crops be good and rates remunerative. But it should be remembered that the numerous roads the company acquired in 1881 were nearly all lines with very small traffic and profits, and that their capacity has not been greatly changed by their incorporation into a great company; and also, that while 1881 was an exceptionally unfavorable year for a system situated like the Wabash, 1880 was an exceptionally favorable year for such a system. In 1880, however, the Wabash system was still unfinished. With completed lines between Chicago and Council Bluffs, Chicago and Omaha and St. Louis and Kansas City, *which obtain full rates*, it would certainly make larger profits than in 1880, with other circumstances as favorable.

The Distribution of Chicago Shipments.

Chicago rail shipments eastward for the week ending April 15 were 33,232 tons, against 38,988 the week before, and 73,362 in the corresponding week of last year, when they were larger than in any other week of the whole year, except the first week of the railroad war. The shipments of the week this year are, with two exceptions, the smallest since September, 1880. The Chicago & Grand Trunk carried 17.4 per cent. of the whole, the Michigan Central 16.8, the Lake Shore 13.4, the Fort Wayne 35.1, the Pan-handle 8.3, and the Baltimore & Ohio 9 per cent. The Grand Trunk has no longer so very large a proportion as in several preceding weeks, but the Lake Shore and the Michigan Central continue far below their usual mark, while the Fort Wayne is far ahead.

It is noticeable that during the first two months of the year, when shipments were very large and carried at ridiculously low rates, the two Vanderbilt roads carried much more than their usual share of freight. Both of them did so for the first five weeks of the year; for the next four weeks the Michigan Central did, but not the Lake Shore. During this time the Chicago & Grand Trunk usually carried less than the 10 per cent. awarded it by the pool of 1880, and the Fort Wayne less than its 23 per cent. under that pool, though its shortage was usually made up by an excess on the Pan-handle, the other Pennsylvania line into Chicago. But after February, or the first few days of March, when higher rates were obtained, the percentages of the Vanderbilt roads fell off, while those of the Fort Wayne, and especially of the Chicago & Grand Trunk, increased greatly, though there was a falling off in shipments by the Pan-handle which partly balanced the increase by the Fort Wayne, and also a little increase by the Baltimore & Ohio. This course of shipments by the different lines out of Chicago may be traced in detail in the following table, showing the number of tons and the percentage shipped by each road for every week of the current year.

CHICAGO SHIPMENTS EASTWARD.

		Percentage of total by				
Week to	Tons.	C. & G.T.	Mich. Cen.	Lake Shore.	Ft. Wayne.	P. C. & St.L.	B. & O.
Jan. 7	55,189	4.5	29.2	32.1	15.7	16.1	2.4
" 14	70,724	5.3	31.9	27.2	18.5	14.1	3.0
" 21	77,679	8.0	31.4	26.0	20.2	11.6	2.8
" 28	80,525	10.2	24.6	29.8	19.5	12.1	3.8
Feb. 4	73,425	9.6	24.9	27.2	21.8	12.1	4.4
" 11	66,499	17.0	24.1	19.9	21.1	10.4	6.5
" 18	57,662	11.8	30.9	19.7	22.2	9.1	6.3
" 25	47,928	6.1	37.3	17.8	24.7	7.9	6.2
March 4	48,681	11.2	27.8	14.8	32.0	8.6	5.6
" 11	47,567	7.0	25.7	24.4	28.2	8.3	6.4
" 18	38,646	17.3	28.1	13.9	29.7	7.3	3.7
" 25	34,335	26.4	22.2	13.1	24.3	8.0	6.0
April 1	32,447	22.7	17.0	15.0	30.8	7.6	6.9
" 8	38,988	21.8	18.7	16.6	28.0	7.2	7.7
" 15	33,232	17.4	16.8	13.4	35.1	8-3	9.0

This table, which is merely a collection of our usual weekly statements, will be found interesting for many reasons. The natural inference to be drawn from it is that when rates were very low and unprofitable the Chicago & Grand Trunk and the Baltimore & Ohio did not seek business; but that the bulk of the contracts at very low rates were by the Vanderbilt roads, which was doubtless true; also, it is natural to infer from these figures that when rates were so advanced as to make the business profitable the Chicago & Grand Trunk sought it energetically, and gained its extraordinarily large proportion by making lower rates than were charged by the other lines; and this, too, is believed by all the Grand Trunk's competitors. The great gain by the Fort Wayne we presume to be at least partly due to the diversion of the Erie's freight lines to this road from the Vanderbilt roads, and this too accounts for part of the decrease on the latter roads, which is not only below the artificially large proportion they obtained in January and February, but also below what we may assume to be their normal proportions under the pool of 1880, namely, 26 per cent. to the Michigan Central and 23 to the Lake Shore.

There is, however, good reason this year why the Chicago shipments might naturally be distributed differently from what is usual. Usually most of its shipments go to the seaboard, and more than half are exported. This year an unusually large proportion of its shipments is consumed at interior points on the trunk lines and even further west, and a comparatively small proportion is exported. Now all the roads alike compete for the exports, but they do not all compete alike for what is consumed at the different seaboard cities, and still less do they compete alike for what is consumed at interior points. The roads closely connected with the New York Central carry nearly all that is consumed at New York Central points; the Pennsylvania roads carry the supplies to Pennsylvania and most of New Jersey; and the Chicago & Grand Trunk receives scarcely any freight destined for Baltimore, very little consigned to Philadelphia, and not very much going to New York (though it now does a larger New York business than heretofore, we understand, owing to better relations with the Erie). Most of what it carries for domestic consumption goes to Boston and other New England points. It is easy to understand, therefore, that when there are light exports the ability of any road to command a given share of the shipments depends more on the consumption of the points on its lines that when exports are large. But this should tell against the Grand Trunk and in favor of the Vanderbilt and the Pennsylvania roads, and not *vice versa*. However, the opening of lake navigation gives the country supplied by the New York Central, and, in a less degree, that supplied by the Erie, an opportunity to supply themselves by lake and canal, and this, when rates are stiffly maintained, works against the Vanderbilt roads especially. New York and Central New York points could soon get grain by canal and at very low rates; and this for several weeks past has naturally had these effects:

1. To lessen rail shipments to the city of New York, which arrive by the New York Central, the Erie, and the Pennsylvania, in their order.

2. To lessen rail shipments to Buffalo and points on the Erie Canal, which, this side of Buffalo, are carried chiefly by the New York Central, but partly (as to Rochester and Albany) by the Erie, and reach them by the Western roads which serve especially as their connections.

Again, the shipments of late weeks are so small that a road which in January carried only enough for consumption along its lines, amounting to 5 per cent. of the Chicago shipments, carrying just about the same amount now, has 10. per cent. of the Chicago shipments. In the second week of January, the Grand Trunk carried but 5.3 per cent. of the Chicago shipments, amounting to 3,748 tons; in the week ending April 15, when it had 17.4 per cent of these shipments, they amounted to but 5,782 tons. On the other hand, the 27.2 per cent. which the Lake Shore had in the second week in January was 19,509 tons; its 13.4 per cent. in the second week of April was but 4,423 tons. The Grand Trunk's percentage more than trebled, with an increase of little more than one-half in its shipments; the Lake Shore's percentage in the later week was nearly half what it was in the earlier one; its shipments not one-fourth as great.

There seems not to be any probability of a conflict over the Chicago shipments; at least no one exhibits any anxiety. The Grand Trunk has "agreed to agree," and the claims it has made for making good its percentage under the pool of 1880 do not apply, as might be supposed from reports published, to the traffic during the railroad war, but only to that before May 1, 1881, when it was somewhat behind. The traffic is sure to be light until after harvest, and as we have explained above, it may not be distributed in the proportions usual when exports are large; but with rates maintained there is some profit on the traffic, and the contracts made insure that each line will get a share of them; and we do not remember a time when all the roads were so strongly disposed to adopt any measures necessary to maintain rates and prevent losses. They have suffered and are still suffering too much from the late conflict to enter carelessly upon another.

March Accidents.

Our record of train accidents in March, given in full elsewhere, shows for that month a total of 99 accidents, in which 29 persons were killed and 101 injured. Eighteen accidents caused the death of one or more persons; 20 caused injury, but not death, leaving 61, or 61.6 per cent. of the whole number, in which there was no injury serious enough for record.

Twenty-four of the killed and 62 of the injured were railroad employés; 5 of the killed and 39 of the injured were passengers or other persons (not employés) riding on the trains, so that, out of a total of 130 casualties, 86, or 66.2 per cent., were employés. This, of course, only includes accidents to trains, and injuries to employés in coupling cars and similar ways are not included.

As compared with March, 1881, there was a decrease of

14 accidents, of 9 in the number killed and of 76 in that injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions	28
Butting collisions	5
Crossing collisions	4
	— 37
DERAILMENTS:	
Broken rails	2
Defective rail-joint	1
Spreading of rails	8
Broken bridge	5
Broken wheel	2
Broken axle	4
Broken truck	1
Loose wheel	1
Wash-out	2
Accidental obstruction	8
Cattle	2
Misplaced switch	4
Low bridge	1
Running off end of siding	1
Unexplained	18
	— 60
Boiler explosion	1
Car burned while running	1
Total	99

Of the collisions six were caused by misplaced switches; five by trains breaking in two; two by the disabling of engineers; one each by fog, by a flying switch, by the absence of proper signals and by a mistake in orders.

Two of the broken bridges were wooden trestles, and one was a new bridge under trial for the first time. In addition to the five broken bridges above, there were two cases in which the failure of the bridge was not the primary cause of derailment, but the structures gave way under the shock of a derailed train running upon them on the ties. The bridges make this month a very bad showing.

The general classification of these accidents is as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road	..	17	..	17
Defects of equipment	6	9	1	16
Negligence in operating	30	5	..	35
Unforeseen obstructions	1	11	1	13
Unexplained	..	18	..	18
Total	37	60	2	99

No malicious derailment was recorded during the month. The unexplained derailments are, as a rule, chiefly due to defective track, as experience and observation indicate. The classification given above, if we leave out the unexplained derailments, shows 43 per cent. of the accidents due to preventable causes, and 37 per cent. more of another class, most of which could be prevented by more careful and thorough systems of inspection.

A division according to classes of trains and accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	1	14	...	15
To a pass. and a freight	10	...	...	10
To freight trains	26	46	2	74
Total	37	60	2	99
Casualties:				
Killed by	4	25	...	29
Injured by	24	75	2	101
Total	28	100	2	130

Derailments were last month most fatal to trainmen, the 60 derailments having killed 21 and injured 48, while in the 37 collisions only 3 were killed and 12 hurt.

As to time, there were 57 accidents in daylight, and 40 at night, while in only two cases the reports do not indicate the time. Night would seem to be the time most favorable for accidents, but experience shows that by far the larger number of accidents happen in the day-time. It may possibly be that the number of trains is usually greater in the day-time, though on some roads a large part of the business is done by night.

Prominent as usual among the accidents which could have been prevented were misplaced switches, which caused ten accidents in all, six collisions and four derailments. Rear collisions were numerous, but the butting collisions were unusually few, but five appearing on the record. On the other hand four crossing collisions are recorded, which is more than generally appear in one month. Crossing collisions are accidents in which carelessness or negligence is almost a necessary element, either on the part of the companies in failing to provide proper means of signaling, or on the part of employés in failing to use or observe the signals properly. With the rapid extension of railroads grade crossings are continually increasing in number, and it is to be feared that very few of them are properly protected by signals. Too often even important crossings are left to a single flagman, with nothing but the ordinary hand-flag or lantern, while in many cases even this much is lacking, and trainmen are expected to look out for themselves.

The weather generally was very good for a spring month. In some parts of the West and South there was much trouble from high water, but only two wash-outs are recorded. It may be noted that a big flood, which puts half a road under water and stops all traffic, is less likely to cause accidents then are small local freshets.

The month has no peculiar lesson beyond that which this record teaches every month in the year—the need of better organization and discipline, more careful and thorough inspection, and, above all, investigation of the causes of accidents and the holding of employés to a strict responsibility.

Two collisions are recorded of a kind which are fortunately rare, though always liable to happen. Both of these were due to sudden disabling of engineers, in one case by an accident to the boiler filling the cab with scalding steam and in the other by a stroke of paralysis, in both cases leaving the engine without control. The first of these, of course, was due to the defect of the boiler, and might possibly have been prevented, although defects of that kind are often difficult to find and remedy. The second was an accident which no human foresight could prevent, and which might occur even with a watchful and efficient fireman in the cab. Such cases are very rare, and we do not recall another of the same nature in all the years in which this record has been kept.

For the year ending with March the record is as follows:

	Accidents.	Killed.	Injured.
April	63	22	66
May	85	24	76
June	73	31	78
July	102	38	122
August	129	31	67
September	144	56	227
October	131	31	133
November	133	50	120
December	113	36	96
January	137	41	198
February	88	23	69
March	99	29	101
Total	1,297	412	1,353
Total, same months, 1880-81	1,372	374	1,652
" " " 1879-80	839	173	626

The averages per day for the month were 3.19 accidents, 0.94 killed and 3.26 injured; for the year they were 3.53 accidents, 1.13 killed and 3.71 injured.

The average casualties per accident were, for the month, 0.293 killed and 1.020 injured; for the year, 0.318 killed and 1.043 injured.

The averages per month for the year were 108 accidents, 34 killed and 113 injured, against similar averages of 114 accidents, 31 killed and 138 injured in 1880-81, and of 70 accidents, 14 killed and 52 injured in 1879-80.

The averages for the year are lower than for the preceding one, but are still very high when compared with other years during which this record has been kept.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Gulf, Colorado & Santa Fe.—Extended westward to Lampasas Springs, Tex., 22 miles.

Missouri Pacific.—Track on the *Omaha Extension* is laid from Weeping Water, Neb., north by east to Papillion, 27 miles.

New York, Susquehanna & Western.—A branch is completed from Paterson station into the city of Paterson, N. J., 1 mile.

Saginaw, Tuscola & Huron.—Completed from East Saginaw, Mich., northeast to Sebewaing, 35 miles. Gauge, 3 ft.

Sharpsville.—Extended from Carbon, Pa., south to Wilmington station, 7 miles.

Texas & St. Louis.—Extended from Waco, Tex., southwest to Mt. Olivet, 12 miles. Gauge, 3 ft.

This is a total of 104 miles of new railroad, making 1,876 miles thus far this year, against 906 miles reported at the corresponding time in 1881, 1,096 miles in 1880, 391 miles in 1879, 267 in 1878, and 269 miles in 1877.

THE CINCINNATI, HAMILTON & DAYTON SALE is much discussed by the Cincinnati papers, with the result of making it uncertain just what has been done. The Cincinnati *Commercial* says that the parties represented by Mr. Jewett pay par for the shares they purchase from a Cincinnati syndicate, that these shares are to be deposited with three Cincinnati capitalists, Messrs. Hooper, Hanna and Werk, who will hold it as as perpetual trustees, appointing their own successors, and that these trustees will issue certificates to the owners of the stock, which will entitle them to all dividends but not to the voting power, which will remain in the trustees. It says, also, that the New York, Lake Erie & Western will indorse these certificates with its guarantee of 6 per cent. dividends on that particular stock. That is, the stock will be entitled to all the profits the Cincinnati, Hamilton & Dayton makes, and this stock, which has given its voting power to the Erie's nominees, will be entitled to 6 per cent. from the Erie if the Cincinnati, Hamilton & Dayton does not earn it. Substantially this would be a guarantee of dividends on a majority of the shares in order to enable the Erie to control the road without leasing and without buying it.

Meanwhile, it is reported that the "Seney interest," which controls the New York, Chicago & St. Louis, the Lake Erie & Western and the Ohio Central, has purchased 9,200 of the 35,000 Cincinnati, Hamilton & Dayton shares from the Cleveland, Columbus, Cincinnati & Indianapolis Company, paying 75 therefor. Just what the object of this purpose is does not appear; one report is that the Seney interest is in harmony with the Erie in this purchase, and there is nothing in the nature of things why they should not work together. The Seney roads will have a good deal of traffic to ship to points east of Buffalo, and they can make the Erie their chief connection if they desire. It would seem, too, to be very good policy for the Cleveland road (under Vanderbilt control) to part with its Cincinnati, Hamilton & Dayton stock at 75. Its last balance sheet reports that its interest in this stock cost it $671,186, but does not say how many shares there were. At 75, 9,200 shares would bring it $690,000, and as the dividends on these shares for nine years past have been but $50,600, there was no encouragement to hold them after the control of the road was lost.

There is also a report that the Pennsylvania Railroad Company is in some way connected with the Erie purchase, and that it will use the Richmond line to complete its route from Chicago to Cincinnati. It can use this short line to advantage, but would not be likely to pay much for it, because it already has a pretty good line, while the Chicago-Cincinnati traffic is not very important, and what there is is pretty well cut up among the different lines. Further, by the Erie purchase the Pennsylvania will cease to give the Erie its Cincinnati connection, as it has been doing for a few months past.

On the whole, the Cincinnati, Hamilton & Dayton stockholders seem to have come out very well; as for the purchasers, it remains to be seen what they will make by their bargain.

PENNSYLVANIA RAILROAD EARNINGS AND EXPENSES have just been reported for March, but reach us just as we go to press, and therefore must be given with little comment, though they are among the most significant signs of the times. For March the gross earnings of all the lines east of Pittsburgh and Erie were $67,989 (1.8 per cent.) more this year than last, while the working expenses were $451,413 (22 per cent.) more, and the net earnings $383,424 (21.3 per cent.) *less* than last year. The enormous increase in expenses is the remarkable feature. There must have been a considerable increase of local traffic to make the gross earnings as large as last year, as the through freight traffic eastward was much lighter this year, and the through westward carried at less than half last year's rates. But the increase in expenses is much greater than the increase of traffic can have been.

Gross and net earnings and expenses in the month of March of the lines east of Pittsburgh and Erie have been, for ten successive years:

	Gross earnings.	Expenses.	Net earnings.
1873	$3,305,901	$2,369,678	$936,223
1874	2,961,575	2,000,021	961,554
1875	2,628,411	1,691,616	936,795
1876	2,663,897	2,033,222	630,675
1877	2,410,804	1,517,168	893,636
1878	2,499,286	1,531,448	967,838
1879	2,603,067	1,615,844	987,223
1880	3,278,186	1,766,938	1,511,249
1881	3,844,304	2,045,078	1,799,226
1882	3,912,293	2,496,491	1,415,802

For the trunk lines generally 1880 was the most prosperous year in their history, but the full effect of the revival of the coal and iron industries and the manufactures which contribute so much to the traffic of this road was not felt until 1881, as we see by the large increase in receipts from 1880 to 1881, for through freight was much heavier and through rates at least as high in 1880 as in 1881. But the increase in expenses since 1880 is 41½ per cent., and in spite of an increase of $634,000 in gross earnings there is a decrease of $95,000 in net earnings since that year. The net earnings, however, remain 43 per cent. or more greater than in March of any year previous to 1880, which should be remembered by those who are inclined to look upon the result this year as positively bad.

For the three months ending with March, the first quarter of the year, the gross earnings of these lines were $468,282 (4.6 per cent.) more than last year, the working expenses $1,057,734 (17.6 per cent.) more, and the net earnings $594,502 (14.3 per cent.) *less*.

For the three months ending with March the earnings and expenses have been, for six years:

Year.	Gross earnings.	Expenses.	Net earnings.
1877	$6,960,070	$4,635,058	$2,325,012
1878	7,058,492	4,467,754	2,590,738
1879	7,684,532	4,504,991	3,179,541
1880	9,306,314	5,196,786	4,109,528
1881	10,129,134	5,965,143	4,163,991
1882	10,592,366	7,022,877	3,569,489

Since 1880 the increase in gross earnings has been $1,286,000, but in spite of this there has been a decrease of $540,000 in net earnings, owing to the enormous increase of $1,826,000 (35 per cent.) in working expenses.

The decline in the profits of the lines west of Pittsburgh and Erie worked in the interest of the Pennsylvania Railroad is, however, much more serious than that of the eastern lines. In 1881 these lines in March earned a surplus of $418,744 over all liabilities; this year the surplus is but $36,532; so that the available profits of the Pennsylvania Railroad Company for the month were no less than $865,636 less this year than last, which sum is equal to very nearly 1 per cent. on the company's stock. And for the three months ending with March there is this year a deficit of $75,034 in the profits of these Western lines, against a surplus of $1,070,718 in 1881 and of $1,049,129 in 1880. This decrease of $995,684 in the surplus profits of the Western lines, added to the decrease of $594,502 in the net earnings of the Eastern lines in the first quarter of the year, makes a total decrease of $1,590,186 in the shareholders' profits—equal to a 2 per cent. dividend.

THE EAST-BOUND FREIGHT CONTRACT seems to be widely misunderstood. The contract signed is by the trunk lines, and it is they, and not the roads further west, that have agreed to divide generally on the basis of the course of traffic in 1880, and to do so for five years, though even this contract provides for a readjustment in case new roads or connections are established. The Western connections of the trunk lines have agreed to divide their traffic but have not provided that the division of freight shall be like that of 1880 or any other year, but will submit the question to arbitration when they cannot agree. The five St. Louis roads have agreed to share alike—each taking 20 per cent. of the traffic as they always have done heretofore. The Chicago roads will divide by arbitration, and most of the others probably. But the absolute limitation of the amount to be carried by each trunk line will somewhat affect their western connections. If the Lake Shore and the Canada roads bring the New York Central too much, the excess will have to be turned over to the Erie, or another road which has less than its proportion, or be paid for in money.

Neither has the decision of the Advisory Commission concerning differences in rates to the different ports anything to do with the time of the apportionment. The division will date from March 13 for east-bound freight and from April

17 for live-stock, whether it be made to-day or next fall, though it is true that if the roads do not accept the decision of the Advisory Commission, or themselves agree on the difference in rates, the contract concerning east-bound freight will be void.

The completion of new lines need not affect the contract in the least, though it may prevent the full benefit that is expected from it. What the roads divide is *their* traffic, not the total traffic; they can no more include the traffic of the New York, Lackawanna & Western and the New York, West Shore & Buffalo than they can the Erie Canal traffic; but the contracting roads can divide their aggregate traffic. If the new roads do not join the combination, but prefer to compete for the traffic, the contracting roads will have to make their rates accordingly, as they now have to meet the competition of the Erie Canal, but they can work together in such a competition as well as they can separately—and probably more effectively. There is doubtless going to be an increase in the competition for the trunk-line traffic. The two new roads into Chicago and the two new ones between New York and Buffalo will surely get a share of the traffic, and they are less likely than old ones to join a combination, because they will have had no experience to indicate how large or how small a share of the business they will be able to secure.

LAKE RATES have been remarkably steady ever since navigation opened, apparently as much as five-sixths of the shipments being at the rate of 2¼ cents a bushel from Chicago to Buffalo, with a very few cargoes at 2 cents, and some at 2⅛ cents, which has been the ruling rate for a few days past.

Canal rates have advanced since the opening on April 11, which is contrary to the usual course of things, and for about a week past they have been 5 cents per bushel for corn and 5½ for wheat from Buffalo to New York, which is probably a fairly remunerative rate for the boatmen. By far the larger part of the shipments from Buffalo leave by canal, and the firmness of the rates of itself indicates that the railroads are maintaining their rates. They evidently will get very little of the grain that goes to the seaboard, under the present circumstances, but they get nearly all the grain carried to interior points, which is this year a much larger amount, and they are making some profit on this traffic. The canal thus being much the cheapest route to the seaboard, we may expect New York to have an unusually large proportion of the Atlantic grain receipts. This will not appear until future weeks, as the first arrivals by canal were on Monday of this week (April 24).

Ocean rates continue nominal. For the past three weeks they have fluctuated generally between ¼d. and ⅝d. per bushel from New York to Liverpool by steam, and in one case a vessel paid 1½ cents a bushel for a few thousand bushels of grain in lieu of ballast; and the steamers are said to have paid for a great deal of grain at Boston, where miscellaneous paying freights are scarcer. These other freights are not down in proportion, but they are very low—flour 6d. per barrel; pork, 1s. per barrel; measurement goods, 10s. to 12s. 6d. per ton.

The large imports and the still larger immigration bring many steamers to our ports, and especially to New York, and our exceptionally light exports prevent their getting full cargoes back, and their competition for these small exports makes the rates very low, and this condition of things will doubtless continue until after harvest. It is of comparatively little advantage to the country, however, because we have so little to export. Meanwhile there is very little employment for sailing vessels in the transatlantic trade, except for carrying petroleum at very low rates.

CHICAGO RAIL SHIPMENTS EASTWARD are discussed more at length in a previous article, including those for the week ending April 15, which were 33,232 tons this year, against 73,362 last, and were less by the Grand Trunk than for three weeks previous, as above shown, but more than is usual.

For the week ending April 22 the shipments billed from Chicago (not including those from points west billed through Chicago) were 21,969 tons, against 28,869 the week before, and 64,036 in the corresponding week of last year. This week the Chicago & Grand Trunk comes down to about its normal percentage, taking 10.1 per cent. of the whole. The Lake Shore gains, but not the Michigan Central, and the Baltimore & Ohio has a larger percentage (10.1) than for many months previously.

THE NEW YORK-CHICAGO FAST TRAINS, we said last week, on the authority of a telegram published just before we went to press, had been taken off. This report, it appears, was not true. The Pennsylvania continues to run its fast train, leaving New York at 9 a. m., and reaching Chicago the next morning.

American Society of Mechanical Engineers' Annual Convention.

The first session of this meeting was held in the lecture room of the Franklin Institute on Wednesday morning, April 19. For the following report of the proceedings we are indebted to the Philadelphia daily papers:

Robert H. Thurston, Professor of Mechanical Engineering in the Stevens Institute of Technology of Hoboken, N. J., and President of the Society, called the meeting to order in a few remarks, explanatory of the condition of the Society and the work before it. He said there are now 295 members on the list, and that the number balloted for at the last meeting would increase the figures to 325. This he regarded as a remarkable growth for so young a society, and, in other respects, he said it was as prosperous and thrifty as could be desired. It had been incorporated since the last session under the laws of the state of New York, and the prospects for its future success are very bright. The Committee on Permanent Location had devised a scheme for the establishment of a central headquarters in New York for the use of this Society, the American Society of Civil Engineers and the Institute of Mining Engineers.

THE CHRONOGRAPH WITH HIPP ESCAPEMENT.

After the remarks of Mr. Thurston the presentation of prepared papers was called for. That on "The Chronograph for Engineering Purposes with the Hipp Escapement" was read by the Secretary, Thomas Whiteside Rae, W. R. Eckert of San Francisco, and Engineer of the mines in the "Comstock Lode," the author of the paper, not being present In his paper Mr. Eckert says that, having for a number of years felt the need of some instrument for measuring and recording the velocity of pumping machinery which he had been brought in contract with professionally at the deep mines on the Comstock lode, where the irregularity due to long and heavy pump rods as well as other masses in motion was greatly felt, he had corresponded with Robert Biggs, C. E., of this city, and the latter had constructed for him the escapement and driving gear now used, but the revolving drum and other arranged parts of the instrument had to be changed, and no way of recording the curves of motion on paper could be used that produced perceptible friction (such as pencils or ink), and, on account of the exceeding sensitiveness of the controlling spring of the escapement, great care was required in securing a perfect balance of the revolving drum with ease of motion without the use of heavy driving weight; in other words all parts of the instrument had to be made as sensitive as possible so as to require the least possible weight to produce the desired motion. Mr. Eckert describes his failures at the start, and the satisfactory results attained after numerous experiments.

C. J. H. Woodbury, of Boston, gave the results of some of his experiments upon the velocity of certain pumping engines—his endeavors to obtain consistent results with the ordinary chronograph where the regularity of the motion of the cylinder was interfered with so seriously by the tremor of the building that it vitiated his results.

Professor Thurston read the next paper, prepared by himself, "On the Several Efficiencies of the Steam Engine." It was an elaborate explanation based upon careful study of the steam engine, the efficiency of fluid, of the machine, of the furnace, of the apparatus or plant and of capital being considered in detail and supplemented with a series of mathematical calculations and tables.

IN MEMORY OF A. L. HOLLEY.

At one o'clock a recess was taken until half-past two, at which hour the Holley Memorial Session opened with the presentation of the following resolutions:

"*Whereas*, We are called upon as a Society to give expression to profound and sincere sorrow in the death of our Vice-President and friend, Alexander L. Holley,

"*Resolved*, That we mourn the death of our friend as an irreparable loss to the profession, as a sad and personal bereavement.

"*Resolved*, That in the death of Alexander L. Holley the country has lost an engineer whose genius and industry have greatly aided our industrial development, and to whom all branches of the engineering profession are profoundly and permanently indebted.

"*Resolved*, That we shall ever hold Alexander L. Holley in cherished remembrance, as one whose life and example are an inspiration to high aims and worthy motives, and who gave a new dignity to all branches of our profession, and that we remember our associations with him as something which made our lives happier and our work lighter.

"*Resolved*, That the Secretary be directed to forward a copy of these resolutions, with the report of our memorial services, to the family of Mr. Holley, with assurance of the deep and tender sympathy we feel for them in their bereavement, and that the committee of five appointed by our Council be directed to co-operate with the committees appointed by other societies in furthering the work of securing a worthy and permanent Holley Memorial in whatever form may be deemed most appropriate and best calculated to keep his work and example before the rising generation of engineers."

Feeling addresses attended the adoption of these resolutions. Professor Thurston, who knew the deceased intimately, said of him: Holley was an honest, earnest, intellectually great man. Professor Thurston announced that committees were considering how and in what form a suitable monument shall be erected to the memory of this most honored of their colleagues.

James C. Bayles, of the *Iron Age*, the eulogist chosen by the Committee to express for all a common grief and common recollections, followed. He reviewed at great length the journalistic career of the deceased, and his record as an inventor of new and patentable devices. Of Holley's personal character he said: "I can speak only as a friend, and best describe him as he seemed to me. Not only was he a man of whose sincerity no one could entertain a doubt, but he was one who dared to put confidence in the sincerity and honesty of others. With him there was nothing perfunctory in his service for others. It was pleasure, in a peculiar degree, to confer benefit, and he was never so happy as when it was in his power to bring happiness to others. Of the irresistible charm of his conversation, of his sunny temperament, his brilliant and his genial good fellowship, I need not speak; but remembering all these, I am moved to write on the tablets of memory, as his epitaph, a paraphrase of the remark of the old farmer of Marshfield as he stood beside the bier of Webster: 'This is a lonesome world and Holley dead.'"

Touching remarks were also made by Senator Eckley B. Coxe, of Luzerne county, Pa.; J. C. Hoadley, of Boston; J. F. Holloway, of the Cuyahoga Steam Furnace Company, of Cleveland, Ohio; Robert W. Hunt, Superintendent of the Albany & Rensselaer Iron & Steel Company; Wm. Metcalf, of the firm of Miller, Metcalf & Parkin, Pittsburgh, Pa.; Charles T. Porter, of the Southwark Foundry & Machine Company, of Philadelphia; Coleman Sellers, of William Sellers & Co., of Philadelphia; Wm. P. Trowbridge, Professor of Engineering, Columbia College, New York City; L. B. Moore, of New York; Albert H. Emery, of New York; W. Barnet Le Van, of Philadelphia; and William E. Partridge, Associate Editor *Iron Age*.

After the adoption of the resolutions, and the announcement of new members elected, the meeting, as a further mark of respect to the deceased Vice-President, adjourned until Thursday morning.

RECEPTION AT THE ACADEMY OF THE FINE ARTS.

Wednesday evening a reception was given to the members of the Society by prominent citizens at the Academy of the Fine Arts. Invitations had been extended to the young members of the School of Mechanical Engineering, all the directors and many of the friends of the Franklin Institute, and representatives of the best society of the city, making a typical gathering of Philadelphia wealth and culture. At 8 o'clock, at which hour the guests began to arrive, the various art rooms of the Academy were brilliantly lighted, and the Germania Orchestra, under the direction of Wm. Stoll, Jr., opened the musical programme with Warren's "Inman Line" march.

From this hour until nearly 9 o'clock the Reception Committee were kept busy welcoming the strangers. The Committee of Ladies consisted of Mrs. Frederick Graff, Mrs. Coleman Sellers, Mrs. Joseph N. Wilson, Mrs. Henry Wilson, Mrs. S. J. McCloud and Mrs. S. W. Coulton, Jr. The Committee of Gentlemen included George B. Roberts, A. J. Drexel, George W. Childs, George H. Boker, Dr. William Pepper and Fairman Rogers.

The General Committee of Arrangements consisted among others of Frederick Graff, Coleman Sellers, Eckley B. Coke and Washington Jones. The reception was brought to a close about eleven o'clock, and the visitors expressed great satisfaction at the pleasure it had afforded them.

SECOND DAY'S PROCEEDINGS.

Thursday was devoted to excursions to various places of interest in and about Philadelphia.

In the evening a

DINNER

was given in Horticultural Hall.

Prof. R. H. Thurston, of the Mechanical Engineering Department of the Stevens' Institute of Technology of Hoboken, N. J., presided, and the following gentlemen sat down to the tables: Stephen W. Baldwin, of New York; J. Sellers Bancroft, of Philadelphia; William M. Barr, of Indianapolis; Charles A. Bauer, Superintendent of the Champion Bar and Knife Company, of Springfield, Ohio; James C. Bayles, of the *Iron Age*, New York; Theo. Bergner, Lorin Blodget, George M. Bond, Hartford, Conn.; James C. Brooks, George W. Childs, T. L. Churchill, Ed. Cloud, C. C. Collins, Erie, Pa.; Henry Colwell, Eckley B. Coxe, Luzerne County, Pa.; E. F. C. Davis, Superintendent Repair Shops Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.; C. F. Deane, Daniel Dougherty, A. J. Drexel, W. W. Drummond, Louisville, Ky.; Chas. E. Emery, New York; A. Faber du Faur, New York; John Fowler, John Fritz, Frederick Graff, Robert Grimshaw, W. W. Harding, F. F. Hemenway, *American Machinist*, New York; Julius S. Hedding, J. F. Holloway, Cuyahoga Steam Furnace Company, Cleveland, O.; J. C. Hoadley, Boston; Prof. F. C. Hutton, Columbia College, New York; H. Hodrith, Washington Jones, A. O. Kittridge, Wm. Kent, Pittsburgh; Dr. Le Conte, Hon. Wayne MacVeagh, William V. McKean, Alex. Miller, L. B. Moore, T. R. Morgan, C. H. Morgan, Worcester, Mass.; J. Morgan, Jr., Johnstown, Pa.; Henry S. Morris, Gen. B. Mallery, Coal & Iron Exchange, New York; A. F. Nagle, Providence, R. I.; Knight Neffet, Wm. E. Partridge, *Iron Age*, New York; Thomas R. Pickering, Portland, Conn.; Charles T. Porter, C. B. Richards, Thomas W. Rae, New York; F. H. Richards, Springfield, Mass.; J. B. Root, Brooklyn, N. Y.; Horace Lee, Coleman Sellers, Coleman Sellers, Jr., Wm. Sellers, H. F. Snyder, Allan Stirling, New York; Geo. S. Strong, Ambrose Swasey, Chicago, Ill.; J. B. Webb, W. O. Webber, Superintendent Allen Paper Car Wheel Co., Pullman, Ill.; T. W. Weeks, W. H. Weightman, Charles Wheeler, Andrew Wheeler, J. J. White, Joseph N. Wilson, C. J. H. Woodbury, Boston; S. T. Wellman, Otis Iron and Steel Co., Cleveland, Ohio; L. Zatoem.

At the conclusion of the repast, Professor Thurston called the participants to order, and announced as the first toast "The Tenacity of Steel Rings," to which Hon. Wayne MacVeagh responded. Then followed "Capital, the most effective of lubricants," Charles E. Emory, of New York; "The Hydraulic Press," William V. McKean; "The Drawing Members of the Profession," Coleman Sellers; "Our Legislators," Eckley B. Coke; "Æstheticism in Modern Engineering," W. E. Partridge; "The Ladies," L. B. Moore; "Our Silent Members," J. C. Bayles. The responses in nearly every instance sparkled with numerous anecdotes and comments, shafts of wit being frequently directed at individuals present.

THIRD DAY.

Prof. Robert H. Thurston, in calling the members to order, stated that the Council had had before it the question of the time and place for the next meeting. After discussion, and in view of the fact that they had no invitation for next summer, and the other fact that a proposition had been made to hold a joint convention with them—the Society of Civil Engineers and the Institute of Mining Engineers—to listen to the Holley memorial services, conducted by Dr. Raymond, it was finally decided that when the present meeting adjourn it should be to meet at the call of the presiding officer, when the time and place of the joint convention could be determined upon by the joint committee. He presumed that the place would be New York and the time in the early fall.

UPRIGHT BOILERS AND PUMPING ENGINE.

The presentation of papers and discussion of the same being in order, J. S. Coon, of Cambridgeport, Massachusetts, gave the "Results of a Test of Upright Boilers and Pumping Engine." Tables were presented covering the whole subject in the minutest details, and at the conclusion of Mr. Coon's explanation there was a short discussion, participated in by A. F. Nagle, of Thomson & Nagle, Providence, R. I.; W. Barnet Le Van, of Philadelphia; Professor Thurston, S. W. Robinson, Professor of Mechanical Engineering, State University, Columbus, Ohio, and John W. Nystrom, of Philadelphia, a non-member.

Following this, Professor Robinson explained, with the aid of drawings, "The Thermodynamics of Certain Worthington and Other Compound Pumping Engines," the object being to determine by theoretical deduction the maximum efficiency of these engines. This is required to guide the practical engineer to a knowledge of the greatest possible effect attainable in engines of the kind considered.

George W. Bond, of the Pratt & Whitney Company, Hartford, Conn., next explained "A Standard Gauge System," and after the reading of the paper, Professor Robinson spoke of it as of the highest possible merit and of the greatest interest to the members of the Society. He said: "It is a matter of great satisfaction to the mechanical engineers of this country that we have some one capable of taking hold of this question and treating it as ably as it has been treated, and inasmuch, as stated by the reader, the methods and results are open for inspection, I think it is our duty to appoint a committee to accept the privileges offered, and make such statements as are thought advisable. Undoubtedly, it is a thing which the Society will be willing and anxious to indorse in every particular as the standard of the country."

Mr. Barnet Le Van said it would be a satisfaction to the Society to know that they have endeavored to do what is proper to bring about a standard gauge.

The proposition was also indorsed by Thomas Egleston, Professor of Metallurgy, School of Mines, Columbia College; Francis A. Pratt, of Hartford, Conn.; John J. Grant, of the Grant & Bogert Machine Tool Works, of Flushing, New York; Wm. Kent, of Shoenberger & Co., Pittsburgh, and Oberlin Smith, President of the Ferracute Machine Company, Bridgeton, N. J. It was then adopted, the Chair being authorized to name the Committee at his convenience.

Professor Trowbridge's paper, on the "Determination of Heating Surface of Ventilating Heating Flues," was read in the abstract form by Professor Hutton, and a second paper, also prepared by Professor Trowbridge, was read by its title, "Rankine's Theory relative to the Economy of Steam in the Cornish Engine."

Wolff's "Note on the Economy of the Windmill as a Prime Mover," followed, and then Mr. Root explained, at

great length and with the aid of a diagram and tables, the results produced by his models of "Screw Propulsion." A recess was here taken until half-past two o'clock.

URGING A COMMISSON ON METAL TESTS.

At the afternoon session, President Thurston announced that the Committee on "Tests of Iron, Steel and other Materials," had voted in favor of a joint effort on the part of engineering and technical organizations to secure the re-establishment of a United States Commission on the subject

Professor Eggleston briefly reviewed the history of the former Commission, which had been legislated out of existence by act of Congress in 1879, and he urged the desirability of a new body, which would take up and carry on the work at the point where the old one left off.

He further said the committee having the matter in charge had decided to memorialize Congress, and, in connection with the Society of Civil Engineers and Institute of Mining Engineers, to secure what they wanted done. In conclusion, he read the proposed memorial, and said that if the public were aware of the great good that could be thus accomplished, these societies would not have to take this step, but the people would go to Congress and compel that body to do the work.

C. J. H. Woodbury, of Boston, thought they all should favor measures relative to the use of testing machines, because the results to be obtained would be of incalculable interest to all. In fact, it pertained to the whole matter of the mechanical arts.

Oberlin Smith, of Bridgeton, N. J., would like to see the Government expend a round million dollars every year in such work. It would pay a hundredfold better than the way in which most of its money was now being spent.

William M. Barr, of Indianapolis; William Kent, of Pittsburgh, and Professor Lanza, of the Massachusetts Institute of Technology, of Boston, spoke in a similar strain. Mr. Kent also read a communication from the Society of Civil Engineers of Western Pennsylvania, stating that that body had already taken affirmative action on the matter.

Professor Thurston explained the history of the movement for the creation of the Board, and Mr. Levan briefly discussed the strength of material used in columnal structures, and said it was one of the points which required careful and thorough investigation.

William E. Partridge, associate editor of the *Iron Age*, and William Metcalf, of Miller, Metcalf & Parkin, Pittsburgh, also favored the proposition, and Professor Eglesston closed the discussion by urging that the arguments presented during the consideration be published as speedily as possible, and distributed among manufacturers throughout the country, so that the public could be fully informed of the value of the benefits to be derived. A resolution of indorsement, offered by Professor Hutton, was then adopted.

EDISON'S STEAM DYNAMOS.

Mr. Root further explained on the blackboard his paper of the forenoon on "Screw Propulsion," and then the paper of Thomas A. Edison, Ph. D., and Charles T. Porter, of the Southwark Foundry and Machine Company, of Philadelphia, descriptive of "the Edison Steam Dynamos, in the New York Central Station" was called for. Mr. Porter stated that Edison was rather slowly recovering from a very severe illness, and that in consequence he regretted that he could not fully show the dynamos by illustrations. He, however, could fully explain them. He said the central Edison station referred to will, when fully equipped, be supplied with twelve dynamos, each of which is nominally rated as a 1,200-light machine, at 16 candle-power incandescence, but is capable of supplying 1,400 lights of this power continuously, and with high economy, without heating the armature or burning or injuring the commutator or brushes. This increased capacity is due to improvements in the lamp itself. The armature of each dynamo is driven by a Porter-Allen engine of 11 3-16 in. diameter of cylinder by 16 in. stroke, directly connected and making 350 revolutions per minute, giving a piston travel of 933 ft. per minute. The steam is supplied by eight Babcock & Wilson boilers, of 2,000 aggregate horse-power, and which will work under a pressure of about 120 lbs.

The next paper was on "Steam and Air Economy," by Samuel McElray, of Brooklyn, the object being to show what can be done to redress waste. "Experiments on the Specific Heat of Platinum," by J. C. Hoadley, of Boston, and "Steamships and Modifications of Models to meet requirements of the Ocean Carrying Trade," by Henry W. Gorringe, Lieut. Commander United States Navy, followed, after which a recess was taken until evening.

A NATIONAL PROJECT.

In the evening, on motion of Oberlin Smith, a committee was appointed to confer with the technical schools and societies of America as to the feasibility of establishing a national bureau of information, to be composed of representatives from the various schools, and to be under the auspices of the United States and Canadian governments.

ANOTHER SERIES OF PAPERS.

A paper prepared by A. Faber Du Faur on "The Expansion of Heat and Water without Transfer of Heat," was read by Alfred R. Wolff, of New York, and supplemented by remarks by the same gentleman and Professor Thurston.

Oberlin Smith followed with a paper on "Position of Views upon Mechanical Drawings," and Professor J. Burkitt Webb, of Cornell University, with one on "Belting," the point discussed being the proper position of two pulleys upon shafts, which neither intersect nor are parallel.

Horace See, of William Camp & Sons, explained "Built-up Work in Engine Construction," and Professor Hutton "The Action of Mineral Wool Used as a Non-Conductor Around Steam Pipe." Papers were also read, by title, on "Efficiency of the Steam Boiler," by Professor Thurston, and "Influence of the Franklin Institute upon Scientific Education," prepared by Frederick Fraley, at the request of the President of the American Society.

A. F. Nagle, of Providence, R. I., followed with a paper on "Heater Performances," and William S. Auchincloss, of Philadelphia, afforded considerable amusement and instruction to the members by a demonstration of the uses of a "Centre of Gravity Machine." Prof. Lauza gave the result of his experiments as to the strength of columns of oak, white oak and other material; and, after the reading of additional papers by title, the Society adjourned.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Central, of New Jersey, annual meeting, at the office in Jersey City, N. J., May 5, at noon. This meeting is not called by the board, and its legality is disputed.

New York & Harlem, annual meeting, at the Grand Central Depot, in New York, May 16, at noon.

Chicago & Northwestern, annual meeting, at the office in Chicago, June 1. Transfer books close April 29.

St. Louis, Alton & Terre Haute, annual meeting, at the office in St. Louis, June 5, at 3 p. m.

Richmond & Danville Extension, annual meeting, in Newark, N. J., May 3.

Chicago, Milwaukee & St. Paul, annual meeting, at the office in Milwaukee, Wis., June 5, at noon.

Railroad Conventions.

The *Railway Car Accountants' Association* will hold its annual meeting in Boston, beginning on Tuesday, May 23, at 10 a. m. The Hotel Vendome has been selected as headquarters for members.

The *General Time Convention*, which was to have been held April 12, has been postponed by general consent, and will be held in Cleveland, O., on call of the Chairman.

The *Western Association of General Passenger and Ticket Agents* will hold its next meeting in Chicago, May 10.

The *Master Mechanics' Association* will hold its annual convention at Niagara Falls, beginning on June 20.

The *Master Car-Builders Association* will meet in annual convention in Philadelphia, June 13.

Dividends.

Dividends have been declared as follows:

Boston & Providence, 4 per cent., semi-annual, payable April 29.

St. Louis, Alton & Terre Haute, 3 per cent., on the preferred stock, payable May 20. Transfer books close May 5.

Pullman's Palace Car Co., 2 per cent., quarterly, payable May 15, to stockholders of record May 1.

Concord, 5 per cent., semi-annual, payable May 1.

Foreclosure Sales.

The *Galveston, Houston & Henderson* road will be sold in Galveston, Tex., Aug. 2, under the decree of foreclosure lately granted. The road extends from Galveston, Tex., to Houston, 50 miles.

Passenger Pool Meeting.

There was a full representation of the Western railroads which are members of the Joint Executive Committee at the meeting of their passenger agents April 26 at Commissioner Fink's office. The plan for the Western passenger pool was discussed. This plan is based on the general features of the trunk line passenger pool agreement, which have been published. The time fixed for its going into effect is March 1. The meeting discussed the provisions of the pooling agreement, but took no definite action. It was expected that on April 27, when the passenger men were to meet again, the agreement will be signed.

Wisconsin General Freight Agents' Association.

At a meeting held in Milwaukee, April 18, a special committee reported that the printed copy of the remodeled and revised Wisconsin classification would be sent them in a few days. It was reported that but a few slight changes had been made in the rate, but the entire phraseology and form of the classification had been very materially altered. The subject of the delivery and identification of property was thoroughly discussed. A decision was reached to the effect that freight, when required, must be personally identified, the presentation of the bill of lading not being considered sufficient. The question of making the maximum and minimum car load weights uniform on the different roads was discussed, but no conclusion was arrived at.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—At the annual meeting in Topeka., April 22, the following directors were chosen: C. K. Holliday, Topeka, Kan.; L. Severy, Reading, Kan.; B. B. Stringfellow, Atchison, Kan.; Sidney A. Kent, Chicago; Oliver Ames, Isaac T. Burr, B. P. Cheney, A. W. Nickerson, Thomas Nickerson, C. W. Pierce, C. J. Paine, Alden Speare, Wm. B. Strong, Boston. Mr. Ames and the two Nickersons are new directors, succeeding T. J. Coolidge, W. P. Mason and S. L. Thorndike; Mr. Thomas Nickerson was formerly a director and for several years President of the company.

The board re-elected Wm. B. Strong President; C. C. Wheeler, General Manager; S. Lothrop Thorndike, Comptroller; Edward Wilder, Secretary and Treasurer; George L. Goodwin, Assistant Secretary and Assistant Treasurer; John P. Whitehead, General Auditor.

Atlantic, St. Johns & Indian River.—The officers are: President, Dr. W. P. Sylvester, Arcola, Ill.; Vice-President and Treasurer, J. McClosky, Decatur, Ill.; Secretary, H. S. Wing, Palatka, Fla.; Chief Engineer, J. J. Shields, St. Augustine, Fla.

Austin & Northwestern.—Mr. W. T. Phillips has been appointed Secretary and Treasurer, Chief Engineer F. A. Hill is appointed Superintendent. Office at Austin, Tex.

Baltimore & Ohio.—Mr. George E. Frankhouse has been appointed Train-Master of the Newark & Columbus Division. He has been on the road for several years.

Bismarck, Mouse River, Turtle Mountain & Manitoba.—The officers are: President, Erastus A. Williams; Vice-President, M. H. Jewell; Secretary, David Stewart; Treasurer, John P. Dunn; General Manager, Alexander McKenzie. Office at Bismarck, Dakota.

Boston, Hartford & Erie.—The stockholders are determined to keep up the organization, though the road is in possession of the New York & New England Company, and met in Boston, April 22, and elected the following directors: John Rooney, Richard A. Roberts, John P. Terry, Delorme Knowlton, Samuel F. Gregory, Henry R. Hilton, James Adair, Wm. M. Denman, M. A. Coleman.

Chicago & Alton.—Mr. W. F. Merrill is appointed General Superintendent. The duties of that office have been for some time past performed by Assistant General Manager Chappell, who is now Acting General Manager. Mr. Merrill has been General Superintendent of the Toledo, Peoria & Warsaw, then General Superintendent of the Peoria & Iowa and the Chicago divisions of the Wabash, St. Louis & Pacific, and was recently made Assistant General Superintendent of that road.

Chicago, Burlington & Quincy.—Mr. W. J. Davenport is appointed Acting Division Freight Agent for the Iowa Division, with office at Burlington, Ia. Mr. W. B. Hamblin succeeds Mr. Davenport as General Agent at Council Bluffs.

Chicago, Milwaukee & St. Paul.—Mr. J. T. Clark has been appointed General Superintendent, and will have immediate charge of the operating department of all the company's lines. He will assume the position about May 15. The office has been vacant for several months. Mr. Clark is now General Superintendent of the Union Division of the Union Pacific road.

Mr. Henry Watkeys has been appointed Master Mechanic in charge of the West Milwaukee shops. He was recently on the New York Central road.

Chicago, Saginaw & Canada—Mr. C. F. Hatch is appointed General Freight Agent in place of H. T. La Bar, resigned. Office at St. Louis, Mich.

Cleveland, Mt. Vernon & Delaware.—Mr. George D. Walker has been appointed Receiver, pending the completion of the new foreclosure suit.

Continental.—At a meeting held in New York last week the following directors were chosen: W. M. Barnum, C. C. Deming, George H. Ely, R. N. Finkhauser, C. B. Hotchkiss, Thomas P. Johnston, W. C. Kibbe, D. Messmore, C. W. Ramsey, H. H. Smith, Milton Weston, Willoughby Weston. The following directors hold over: S. G. Cozzens, A. G. Day, R. S. Dwiggins, George E. Jarrington, J. B. Stewart, Wm. Thorp. It is given out that some of these directors will soon be replaced by prominent capitalists; but the same story has been told at intervals ever since 1872, and the promise has not yet been fulfilled. The board elected the following officers: Milton Weston, of Chicago, President; Wm. H. Smith, of Urbana, Ill., Vice-President; Austin G. Day, of New York, Treasurer; Thomas P. Johnston, of New Jersey, Secretary.

Cumberland Valley.—The following circular is dated Chambersburg, Pa., April 21:

"Notice is hereby given that Mr. O. N. Lull, on the first of the present month, resigned his position as Chief Engineer and Purchasing Agent of this company.

"All purchases for the use of the company will hereafter be made by J. F. Boyd, Superintendent, or Thomas B. Kennedy, President."

Detroit, Grand Haven & Milwaukee.—Mr. G. R. Nash has been appointed Assistant Manager in place of John Burton, transferred to the Great Western Railway.

Fort Wayne, LaFayette & St. Louis.—The officers of this new company are: President, A. M. Duke, Peru, Ind.; Vice-President, Calvin Cowgill, Wabash, Ind.; Secretary and Treasurer, C. O'Donnell.

Houston & Texas Central.—Mr. E. B. Allen is appointed Car Accountant in place of G. T. Cames, assigned to other duty.

Kansas City, Springfield & Memphis.—This company recently elected George H. Nettleton President; J. S. Ford, Secretary; Charles Merriam, Treasurer. It is controlled by the Kansas City, Ft. Scott & Gulf Company.

Lake Erie & Western.—Mr. David S. Hill, heretofore Superintendent of the Eastern Division, has been appointed Superintendent of the whole road.

Litchfield, Carrollton & Western.—The officers of this company are: President, G. W. Davis; Vice-President, I. J. Peebles; Secretary, H. H. Montgomery; Treasurer, O. Pierson. Office at Carrollton, Ill.

Louisville, New Albany & Chicago.—Mr. E. B. Stahlman has been appointed Assistant to the President and Traffic Manager. Mr. Stahlman was formerly connected with the Louisville & Nashville as General Freight Agent and afterwards as Traffic Manager; he resigned that position about two years ago, and has since been in business in Nashville.

Louisville Southern.—The directors of this new company are: W. B. Hoke, E. F. Madden, E. D. Standiford, R. S. Veech, Bennett H. Young.

Millersburg Branch.—The directors are: St. John Boyle, N. F. Carr, C. K. Drew, Jacob Eicbel, C. J. Keegan, J. J. Kleiner, Gerhart Meyer, W. F. Nisbet, Charles Parke. Offices at Millersburg, Ind.

New York, Chicago & St. Louis.—At a recent meeting of the board Mr. D. W. Caldwell was chosen a director and Second Vice-President. He will have charge of the management and operation of the road, the First Vice-President, C. S. Price, taking the management of the finances of the company.

New York & New England.—The following order from General Manager S. M. Felton, Jr., is dated Boston, April 18:

"Mr. O. M. Shepard, Superintendent of Transportation, having resigned, the duties of the position will be performed by the General Manager.

"Mr. T. W. Kennan is appointed Superintendent of the Eastern, Western & Springfield divisions, including the Woonsocket, Valley Falls, Rockville, Southbridge and Melrose branches, with headquarters at Hartford.

"Division superintendents will hereafter report direct to this office."

The following order from the same officer is dated April 19:

"Mr. Charles E. Paige is appointed General Agent of this company at Boston, vice J. G. D. Knight, resigned. He will have immediate control of the local freight agency, including the warehouses, elevator and coal sheds at Boston, South Boston and First street; of all persons employed in connection therewith, and of yard and switchmen, so far as pertains to the transaction of the freight business at Boston. He will report to and received his instructions from this office."

New York, Pennsylvania & Ohio.—The following circular from General Manager P. D. Cooper is dated Cleveland O., April 24:

"Mr. W. B. Shattuc, General Passenger and Ticket Agent of this Company, having, much to our regret, resigned his position, Mr. A. E. Clark has been appointed Acting General Passenger and Ticket Agent, to take effect May 1. He will have charge of the passenger and ticket business of this company's lines until further notice."

Northern Pacific.—Col. Robert Lamborn has been appointed Land Commissioner. He was formerly connected with the Kansas Pacific road.

Oil City & Chicago.—The officers of this company as consolidated are: President, John W. Jones, Philadelphia; Vice-President, Archer N. Martin, New York; directors, F. W. Mitchell, Oil City, Pa.; Wm. Patterson, New Castle, Pa.; Clarence H. Clark, B. K. Jamison, E. A. Rollins, George F. Tyler, Philadelphia; C. H. Allen, Edward L. Owen, Isaac N. Seligman, Giles E. Taintor, New York; Secretary and Treasurer, Joseph R. Trimble.

Oley Valley & Lehigh.—This company has been reorganized with the following officers: President, John O. Keim, Philadelphia; directors, S. K. Cleaver, Pleasantville, Pa.; John B. Bertolet, Oley, Pa.; Israel M. Bertolet, Friedensburg, Pa.; George K. Lorah, Brumfieldville, Pa.; George Brooke, Birdsboro, Pa.; W. B. Griesemer, H. Y. Kaufman, George D. Stitzel, Reading, Pa.; Edward M. Davis, Philadelphia; Secretary and Treasurer, R. B. Kinsey, Reading.

Ontario Southern.—Mr. Frank Youngs has been appointed General Passenger Agent, with office at Sodus Point, N. Y.

Ovid & Traverse Bay.—The officers of this company are: Charles Farmer, President; H. Beattie, Secretary; E. De Camp, Treasurer. Offices at Ovid, Michigan.

Pennsylvania Company—An order has been issued announcing the resignation of D. W. Caldwell, General Manager, and directing the Manager hereafter to report directly to the Vice-Presidents upon the matters respectively in their charge.

Peoria & St. Louis Air Line.—This new company has chosen officers as follows: President, T. W. McNeely, Petersburg, Ill.; Vice-President, E. W. Hogg, Bunker Hill, Ill.; Secretary, J. G. Straten; Treasurer, J. A. Braham.

Pittsburgh, Cincinnati & St. Louis.—President George B. Roberts has issued the following order:

"Mr. D. W. Caldwell having resigned his position as General Manager of this company, to take effect May 1, prox., the duties heretofore performed by the General Manager will, until further orders, devolve upon and be performed by the Manager. The Manager will also perform the duties devolved by the organization upon the General Superintendent, and officers heretofore reporting to the General Manager and General Superintendent will hereafter report to the Manager. The Manager will report directly to the Vice-Presidents upon the matters respectively in their charge.

Pueblo & Arkansas Valley.—At the annual meeting recently the following directors were chosen: W. B. Strong, C. C. Wheeler, I. T. Burr, B. P. Cheney, E. Wilder, L. M. Sargent, M. D. Thatcher, O. H. P. Baxter, James Clelland. The road is leased to the Atchison, Topeka & Santa Fe.

St. Louis & Cairo.—Mr. W. F. Whitehouse is President and Charles Hamilton General Superintendent. Office in St. Louis.

St. Louis, Salem & Little Rock.—At the annual meeting in Salem, Mo., April 13, the following directors were chosen: H. A. Crawford, C. L. Foote, R. S. Hayes, C. W. Rogers, St. Louis; Wm. L. Scott, Erie, Pa.; A. L. Crawford, New Castle, Pa.; Jay Gould, New York.

Seattle, Puget Sound & Gray's Harbor.—The officers of this new company are: President, Wm. A. Newell; Vice-President, J. R. Lewis; Secretary, John M. Kollock; Treasurer, George D. Hill; Solicitor, Richard Osborn; General Superintendent, Wm. Peel. Office at Seattle, Washington Territory.

Terre Haute & Indianapolis (Vandalia Line).—The following circular from President McKeen is dated April 24:

"Mr. D. W. Caldwell having resigned the position of General Manager of this company's lines, to take effect May 1, proximo, the duties heretofore performed by the General Manager will devolve upon the General Superintendent."

Toledo, Cincinnati & St. Louis.—Mr. Henry A. Phillips is appointed Chief Engineer in place of A. W. Johnston, resigned. Mr. Phillips was recently Road-Master of the Lake Shore & Michigan Southern road at Englewood, Ill.

Trunk Line Passenger Pool.—Mr. R. T. Brydon has been appointed Secretary of the new pass enger pool, and will have his office with Commissioner Fink in New York. Mr. Brydon has been for some time Assistant General Passenger Agent of the Chicago, Burlington & Quincy road.

Union, of Baltimore.—The sale of this road to the Northern Central Company has been completed and the stock transferred. Last week the old board resigned and the following directors were chosen: L. W. Gunther, G. S. Brown, W. G. Harrison, W. B. Brooks, B. F. Newcomer, Geo. Small, Oden Bowie, Harry Walters, Bernard Carter. The new board elected the following officers: President, B. F. Newcomer; General Manager, Frank Thompson; Superintendent, Geo. C. Wilkins; Treasurer, J. C. Leib; Secretary, John Crowe. The division officers of the Northern Central have their authority extended over the road.

Valley, of Ohio.—At the annual meeting in Cleveland last week, the three directors whose terms then expired, were re-elected as follows: S. T. Everett, D. L. King, J. H. Wade. The board re-elected J. H. Wade President.

Mr. Charles McD. Kile is appointed Assistant General Freight Agent, with office in Cleveland, O.

Mr. Frank D. Everett is appointed Freight Agent at Cleveland.

PERSONAL.

—Mr. J. B. Clark has resigned his position as Superintendent of the Western Division of the Lake Erie & Western road.

—Mr. George B. Parsell has resigned his position as Superintendent of the St. Louis Division of the Wabash, St. Louis & Pacific road.

—Mr. A. W. Johnston has resigned his position as Chief Engineer of the Toledo, Cincinnati & St. Louis road. His present address is at Leavenworth, Kansas.

—Mr. John C. Whitin, a wealthy manufacturer and a director of the Providence & Worcester Company for many years, died at his residence in Northbridge, Mass., April 22, aged 75 years.

—Mr. Henry Hobart died at East Braintree, Mass., April 24, aged 68 years. He was a contractor and was a director of the South Shore Railroad Company before its consolidation with the Old Colony Company.

—Mr. G. H. Hull, Train-Master at Aurora, Ill., on the Chicago, Burlington & Quincy, having resigned in order to accept a position on the Wabash, St. Louis & Pacific road, was recently presented with a gold watch and chain by his associates on the Burlington road.

—Mr. C. A. Scott, Assistant Superintendent of the Quebec, Montreal, Ottawa & Occidental road, has resigned, to accept a position in connection with a mining association in Nova Scotia. He will reside at Halifax. Mr. Scott has made a reputation as a faithful, energetic and capable officer.

—Mr. N. E. Chapman, who lately left the Cleveland & Pittsburgh road to take charge of the Motive Power Department of the Baltimore & Ohio, had a reception given to him by prominent citizens and railroad men at Cleveland, O., on the evening of April 20. During the evening the employés of his old road presented Mr. Chapman with a costly gold watch and chain and his wife a splendid diamond brooch.

—Mr. W. B. Shattuc has resigned his position as General Passenger and Ticket Agent of the New York, Pennsylvania & Ohio Railroad. Mr. Shattuc has had charge of the Passenger Department of that road for a number of years, and is one of the best known passenger men in this country. He is a prominent member of the National Association of Passenger Agents, and was recently its President. Mr. Shattuc has accepted a position on the Ohio & Mississippi.

—Gen. Wm. L. Burt died of paralysis at Saratoga, N. Y., April 21. He was born in Wilbraham, Mass., and at an early age removed to Ithaca, N. Y. He graduated at Harvard College and the Harvard Law School, and in 1853 began to practice law in Boston. During the war he was Judge Advocate General on Gov. Andrews' staff, and took an active part in raising and sending forward troops from Massachusetts. For nearly eight years he was Postmaster of Boston. Gen. Burt early took an interest in railroads and was the projector of the Suffolk Horse Railroad and other local projects about Boston. He was the projector and for several years President of the Utica, Ithaca & Elmira road, and later was the projector of the Boston, Hoosac Tunnel & Western, and was President of that company at the time of his death.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Three months ending March 31:				
Atch., Top. & S. F...	$3,247,000	$2,203,000	I. $1,044.000	47.4
Ches. & Ohio.....	596,780	575,410	I. 21,370	3.7
K. C., L. & So. K...	217,429	154,940	I. 62,499	40.3
Nash., Ch. & St. L..	477,960	576,719	D. 98,759	17.1
Net earnings.....	200,181	225,195	D. 25,014	11.1
Pennsylvania	10,592,366	10.129,134	I. 463,232	4.5
Net earnings.....	3,569,489	4,163,991	D. 594,502	14.3
Phila. & Reading....	4,403,585	4,256,127	I. 147,458	3.2
Rochester & Pitts...	62,285	51,108	I. 11,177	21.8
Month of March:				
Atch., Top. & S. F..	$1,161,000	$902,000	I. $259,000	28.7
Ches. & Ohio.....	208,981	228,481	D. 19,500	8.5
K. C., L. & So. K....	82,000	61,000	I. 21,000	34.4
Nash., Ch. & St. L..	161,005	207,710	D. 46,705	22.4
Pennsylvania	3,912,293	3,844,304	I. 67,989	1.8
Net earnings	1,415,802	1,799,226	D. 383,424	21.3
Phila. & Reading....	1,610,089	1,600,568	I. 9,521	0.6
Net earnings.....	600,440	682,456	D. 82,016	12.0
Second week in April:				
Chi. & Eastern Ill...	$30,003	$33,518	D. $3,515	10.5
Chi. & Gd. Trunk...	47,228	33,502	I. 13,726	40.9
Wabash, St. L. & P..	320,408	268,488	I. 51,920	19.3
Third week in April:				
Denver & R. G.....	$139,414	$104,104	I. 35,310	34.0
Mil., L. S. & W.....	16,230	10,094	I. 6,136	60.7
Northern Pacific....	125,860	48,820	I. 77,040	157.8

Grain Movement.

For the week ending April 15, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantics ports have been, in bushels, for the past six years:

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P. c. by rail.	Atlantic receipts
1877....	2,517,399	2,268,531	1,881,480	84.9	2,321,586
1878....	4,030,622	3,592,616	759,316	21.1	2,809,653
1879....	2,503,486	3,256,090	.....	....	5,086,829
1880....	3,064.997	3,805,446	1,492,295	39.2	5,037,852
1881....	3,765,907	4,110,869	3,337,380	81.2	4,147,460
1882 ...	2,575,624	3,341,280	1,552,689	46.5	1,374.499

The receipts of the Northwestern markets, though a third less than in the corresponding week of last year, were the largest for eight weeks this year. The shipments of these markets, though much less than last year, are the largest since Nov. 19 last, and the rail shipments, though not half as great as last year, are the largest for four weeks and with one exception the largest since February. That they should keep up so well after navigation opens is noticeable. The lake shipments were 50.3 per cent. of the whole, and 106,904 bushels (3.2 per cent.) went down the Mississippi. The Atlantic receipts, though smaller than in the corresponding week of any previous year recorded, were still the largest for five weeks.

Of the Northwestern receipts Chicago had 29.7 per cent., St. Louis 22.6, Peoria 18.4, Toledo 11.8, Detroit 7.8, Milwaukee 6.1, Cleveland 2.6 and Duluth 1 per cent.

Of the Atlantic receipts New York had 58.8 per cent., Baltimore 13, Philadelphia 10.9, Boston 10, New Orleans, 2.7, Portland 2.3 and Montreal 2.3 per cent. The whole of the gain over the previous week was at New York.

In this week, ending April 15, the exports of Atlantic ports were 896,761 bushels—56.3 from New York, 22.5 from Baltimore, 8.6 from Philadelphia, 6.4 from Portland, 3.5 from Boston and 2.7 from New Orleans.

For the week ending April 19 the Atlantic exports were 950,093 bushels of grain and 51,037 barrels of flour this year, against 3,528,623 bushels of grain and 138,759 barrels of flour in the corresponding week of last year.

For the week ending April 22 receipts and shipments at Chicago and Milwaukee were:

	Receipts. 1882.	1881.	Shipments. 1882.	1881.
Chicago.....	1,345,276	1,202,243	2,202,251	2,175,215
Milwaukee.....	181,541	221,422	189,799	238,890
Both.....	1,526,817	1.423,665	2,392,050	2,414,105

The receipts this year were thus a little larger than last year, which they have not been before for a long time, but receipts were small at this time last year, were so comparatively in May as well as April, not becoming very large until June. The shipments were a little less this year than last, in spite of the fact that lake navigation was open this year and not last.

For this week, ending April 22, receipts of four Eastern ports were:

Bushels.	New York.	Boston.	Phila.	Baltimore.	Total.
1882....	886.094	200,339	357,720	136,726	1,580,879
1881....	2,612,094	540,520	370,750	773,732	4,297,096
P. c. of total:					
1882.....	56.1	12.7	22.6	8.6	100.0
1881.....	60.8	12.6	8.6	18.0	100.0

This is the first week for several months that the percentage of New York has been less than last year, and that the percentage of Philadelphia has been much larger than last year. But it is common when lake navigation is open, and before canal shipments have had time to arrive, for New York to have a smaller percentage than immediately before or after. When canal receipts begin, New York is likely to have a larger proportion even than the large one it had last winter.

The receipts of Buffalo for this week ending April 22 were 156,300 bushels by railroad, and 707,200 by lake; its shipments, 393,300 by rail an 1,716,400 by canal, the latter showing that the canal is more decidedly the cheapest route to the seaboard.

Coal Movement.

Coal tonnages for the week ending April 15 are reported as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Anthracite.	656.345	408,448	I. 247,897	60.4
Semi-bituminous.....	74,895	104,516	D. 29,621	28.3
Bituminous, Penna.....	61,560	46,466	I. 15,094	32 5
Coke, Penna.....	52,484	51,233	I. 1,251	2.4

Anthracite trade is still reported very dull, although production is large.

The stoppage of production in the Cumberland Region continues, with no present prospect of an end of the strike. There have been threats of a strike in the Clearfield Region and a few miners have stopped work. An uneasy feeling is reported, which may end in a strike.

The coal tonnage of the Pennsylvania Railroad for the week ending April 15 was: Coal, 152,042; coke, 52,484; total, 204,526 tons. The total tonnage this year to April 15 has been 3,148,070 tons.

Commissioner Daniels, of the Iowa Trunk Lines Association, has issued the following circular regarding coal rates: "For the purpose of equalizing rates by the various routes of the lines in this association, the tariff on hard (anthracite) coal coming from Buffalo, Black Rock, Suspension Bridge and Erie, from and after April 24, will be as follows: To Council Bluffs from Toledo and Detroit, 24.47 cents per 100 lbs.; Chicago and points common thereto, 20 cents; Peoria and Beardstown, 20 cents; East St. Louis, 17.77 cents; St. Louis, 15.27 cents. The above rates do not apply to local shipments of hard coal from Toledo, Detroit, Chicago, Peoria, East St. Louis, St. Louis, etc., or to through shipments from points other than those named below, but only to through shipments coming from Buffalo, Black Rock, Suspension Bridge and Erie."

Chicago and Milwaukee Receipts.

For the three weeks ending April 21 receipts have been for four successive years:

	1879.	1880.	1881.	1882.
Chicago:				
Grain, bush.....	4,096,695	3,302,641	3,589.212	2,990,034
Flour, bbls.	231,020	166,313	355,227	179,960
Hogs, No.....	235,870	311,238	199,960	326,563
Milwaukee:				
Grain, bush.....	705,940	385,789	693,079	533,251
Flour, bbls.....	156,278	92,940	200,696	132,562
Hogs, No.....	8,704	20,694	10,387	19,014

The receipts of grain have increased considerably recently.

Reducing flour to grain, the receipts of the two places, flour and grain, have been:

Bushels.....	1879. 6,410,476	1880. 4,945,068	1881. 6,783,944	1882. 4,929,634

The receipts for the three weeks this year, though 28 per cent. less than last year and 23 per cent. less than in 1879, are nearly the same as in 1880. But in 1880 the March receipts had been extraordinarily large.

Carrying Out the Live Stock Contract.

The following extract from a circular issued by Commissioner Fink describes the means by which it is intended to cause shipments to be distributed among the roads in accordance with the percentages awarded them:

"In order further to aid in the proper division of the tonnage the plan heretofore adopted by the Joint Executive Committee of appointing a joint agent of the terminal roads at each of the points where a division of live stock traffic is made, which agent shall order shipments to be made in accordance with the directions of the Commissioner, shall be adopted and carried out; and all shippers who shall conform to the directions of such joint agent shall be entitled to reductions as formerly agreed upon, or as may hereafter be agreed upon, as an inducement to ship in accordance with such directions; all shippers failing to do this shall pay the gross established rate.

"In order the more effectually to carry into execution the provisions of the foregoing section, the following plan shall be carried out in connection with the Western roads represented on the Joint Executive Committee, viz: All cattle and sheep from points where an agreed division has been or shall be made shall be billed at the gross rate. On all shipments made in accordance with the direction of the Commissioner and the joint agents, the agreed amount of reduction shall be paid to the shippers by the Eastern terminal roads. On all shipments not in accordance with such directions, the Eastern terminal road shall pay the amount of such agreed reduction to the Commissioner, who shall make such disposition of the same as may be hereafter agreed upon by the parties in interest. The Eastern terminal roads will collect the proportion of such payment due from their connections upon copies of the voucher receipts by the shippers or Commissioner as above provided.

"In accordance with the above, the joint agents at points of division will note in red ink upon the report made to this office any shipments that are not made in compliance with their directions, also stating by what route the shipments should have been forwarded. The initial roads will please instruct the billing agent of live stock to note upon the waybill, when so instructed by the joint agents, all shipments not made in accordance with his directions, and in rebilling at intermediate stations the same notation should be made upon the way-bills. The terminal roads collecting the freight from the shipper, on all shipments not made in accordance with the directions of the joint agents, will prepare vouchers for the amount of the agreed reduction, giving the original point of shipment, number of cars in which loaded, and all other particulars, for the purpose of identifying the shipment, and send the same, with the agreed amount of reduction, to the Commissioner.

"All live stock is to be billed at the gross rate."

Petroleum.

The production of the Pennsylvania oil fields for March is reported as follows by Stowell's *Petroleum Reporter*, the standard authority for the trade, in barrels of 42 gallons:

	1882.	1881.	Increase.	P. c.
Production	2,482,170	2,274,439	207,731	9.1
Shipments.....	1,718,956	1,276,740	442,216	34.6
Stock, March 31.....	27,822,825	22,105,789	5,717,036	25.9
Producing wells.....	18,850	15,500	3,350	21.6

Of the production, 65 8 per cent. was in the Bradford District and 22.0 per cent. in the new Allegheny District, making 87.8 per cent. from the extreme northern end of the district. The production for the month is the largest on record.

Of the total stock, 551,723 barrels were at wells, 100,000 barrels in private tanks, and 27,171,102 barrels with the pipe lines.

The shipments out of the region were:

To—	Barrels.	P. c. of total.
New York.....	911,780	53.0
Philadelphia.....	94,436	5.5
Baltimore.....	17,685	1.0
Cleveland.....	434,146	25.3
Pittsburgh.....	38,863	2.3
Local points	131,326	7.6
Refined at Creek refineries.....	90,720	5.3
Total.....	1,718,956	100.0

Of the total shipments reported, 333,810 barrels, or 19.4 per cent., were by rail, the rest by pipe lines.

Shipments of refined oil from Creek refineries (reduced to its equivalent in crude) were: New York, 13,995; Philadelphia, 1,116; Baltimore, 3,296; Boston, 30,025; local points, 42,288; total, 90,720 barrels.

Southwestern Railway Association.

At a meeting held in Chicago, April 19, the division of the lumber business was agreed upon, and the percentages for each road fixed. The pool will date from March 31.

It was decided to appoint a board of arbitrators, consisting of one lumberman each for the following divisions of territory: Chicago, Clinton to Rock Island, Burlington to Keokuk, Hannibal to Louisiana, Mo., and St. Louis. These men are to determine what differences should be charged from the place where the lumber is taken to its destination.

Messrs. Midgley and Potter offered a satisfactory report in regard to the business that shall be considered remunerative and competitive from the line of the Burlington & Missouri River in Nebraska. The figures will be ready in a few days. This completes all the details of the pooling agreements.

New York-Boston Fast Trains.

The new fast express, which is to make the run between New York and Boston in six hours, will be put on about May 1; it will be an afternoon train. At the same date the time of the morning fast train will be somewhat shortened.

New York-Chicago Fast Trains.

The reported withdrawal of the New York and Chicago limited express on the Pennsylvania Railroad is denied by the Pennsylvania Railroad officials. They have no intention, they say, of discontinuing the New York and Chicago limited, which leaves New York at 9 a. m. and Chicago at 5 p. m. daily; that the train is an assured success, and is constantly growing in favor. The only change proposed in the present schedule of trains over the Pennsylvania Railroad is in the arriving time at Chicago of the Western express, which leaves New York at 6 p. m. This train, which now reaches Chicago at 10.40 p. m. will be made to reach that point about 7 o'clock the following morning.

East-bound Rates to Interior Points.

Rates on grain from Milwaukee to the following points east of the western termini of the trunk lines have been reduced and are now 10 cents per 100 lbs. to Toledo, Detroit and Cleveland; 15 cents to Erie, Ashtabula, O., Oil City, Pa., Youngstown, Hubbard, O., Niles, Warren, Akron, O., Shenango, Greenville, Sharon, New Castle, Clarksville, Corry, Union and Titusville, Pa., and Jamestown, N. Y., and 16 cents to Dunkirk. All these are places affected by lake competition.

Pacific Through Passenger Travel.

Arrivals and departures of through passengers at California points for the quarter ending March 31 were as follows:

	Arrived.	Departed.
By rail	11,156	6,598
By sea	10,139	2,414
Total	21,295	9,012

The arrivals by rail are the most numerous ever reported since the Central Pacific road was completed, with one exception, the first quarter of 1875, when 11,646 arrivals were reported.

Of the arrivals by sea 7,557 were from China and Japan.

Passenger Rates.

The Chicago *Tribune* of April 22 says: "The general passenger agents of the Eastern trunk lines informed Commissioner Dixon of the Western Trunk Lines Passenger Association, April 6, that they have decided to discontinue the use of the war rates from New York, Philadelphia, Baltimore and Washington to points west of Chicago and St. Louis on and after April 15.

"The action was a surprise to the general passenger agents of the Western roads. The Western roads leading to St. Louis and Kansas City were satisfied with the war rates, $4 from Chicago to St. Louis and $5 to Kansas City, as their proportion of the Eastern through business, and had made no demand for a restoration of rates. They could not see why the Eastern trunk lines should desire to give them more than they asked, and for this reason the Eastern trunk lines were requested to reconsider their action, as the St. Louis and Kansas City roads would continue to charge war rates, and there was no prospect of an advance in rates.

"Owing to these requests the trunk lines took the matter again under advisement, but they failed to reconsider their previous action, as will be seen by the following telegram received by Commissioner Dixon yesterday from the general passenger agents of the trunk lines:

"'Referring to previous telegram of April 6, after further discussion of the question, at the request of some of the Western lines, we have decided to advance Missouri River rates to tariff, taking effect April 20, as was at first proposed.'"

Hereafter, therefore, passengers, who wish to secure the low rates now prevailing between Chicago and Missouri River points must buy tickets to Chicago only, and there purchase new tickets to destination.

RAILROAD LAW.

West Virginia Railroad Taxation.

A dispatch from Wheeling, W. Va., April 23, says: "Yesterday a decision of much importance was rendered by the Supreme Court of this state. The facts are as follows: In 1866 the Chesapeake & Ohio Railroad was chartered by the Legislature of this state, and in their charter was a provision exempting the road from taxation until its net earnings should be sufficient to pay a dividend of 10 per cent. on its capital stock. The road was commenced soon after and the work prosecuted as funds could be obtained, and finally completed through the state. No attempt to collect taxes on the road-bed, rolling stock, or other property of the company was made until 1879, when the State Auditor, under the powers vested in him, assessed the entire property, and sent the same to the several counties for collection. Immediately the Chesapeake & Ohio Company filed a petition for an injuction in the Circuit Court of Ohio County, and after an argument, which brought forth all the best intelligence of the bar of the state, the Circuit Court decided the exemption was legal and perpetuated the injunction. The case was immediately appealed by the state, and was elaborately argued last March, and on Saturday the Court decided the case, Judge Johnson delivering the opinion of the Court. The Court holds that the act of the Legislature is unconstitutional, being in violation of the provision which says that taxation shall be equal and uniform in the state. The opinion is very elaborate and covers the whole ground, and will undoubtedly attract much attention. The amount involved is very large, the back taxes aggregating about $150,000, and the taxes to which the road will hereafter be liable will exceed $30,000 per year. In addition to this it will affect all other railroads in this state, as they have similar exemptions, and will add, if enforced, about $50,000 per year to the taxes of the state."

Carrier's Liability—Connecting Road.

In Cole & Co. against the Georgia Railroad & Banking Co., the Georgia Supreme Court holds as follows:

1. Where goods are delivered to the first of a connecting line of railroads to be shipped to a given destination by a specified route, a delivery by the first railroad to another railroad which forms a part of a different route is a breach of the contract and a conversion which renders the first road liable for the value of the goods. If they be delayed by such delivery or damage result, the first road may be held responsible therefor.

2. Mere acceptance of a portion of the goods shipped by railroad, on arrival at their destination, is not a waiver of all claim for loss resulting from delay.

3. With hesitation we refuse damages on the ground that this case was brought up for delay only. We base our refusal on the fact that the question of the result of the receipt by the shipper's agent of some of the goods on arriving at their destination contains some merit.

Judgment of the lower court affirmed.

THE SCRAP HEAP.

Locomotive Building.

The Central Vermont shops at St. Albans, Vt., have completed a new mogul freight engine for the road.

The Manchester Locomotive Works at Manchester, N. H., turned out 15 engines in March. They have recently completed several for the Mexican Central road.

Work is progressing well on the new locomotive works at Rome, N. Y. The buildings are nearly finished and the machinery is being put in place. The buildings include a machine shop 80 by 270 ft., two stories high; blacksmith shop, 65 by 170 ft.; boiler shop, 70 by 170 ft.; foundry and pattern shop, 80 by 270 ft.; engine house and some other buildings. A transfer table, between the machine shop and paint shop, is ready for use.

The New York Central engines are to have a patent headlight made by the Kelly Lamp Works at Rochester, N. Y. These head-lights are so made as to display the number of the engine, and also to show different colors for signal purposes, the colors being changed by mechanism worked from the cab.

The Baldwin Locomotive Works in Philadelphia have delivered four engines to the Valley Railroad, of Ohio.

Car Notes

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., recently delivered five passenger cars to the Central Railroad, of New Jersey. They are the last of a large order, and make 237 passenger cars in all built at these shops for the same road.

The Gilbert Car Works, in Buffalo, N. Y., have taken a contract to build the cars for the Herkimer, Newport & Poland road.

The Fargo Car Wheel & Iron Co. is building a foundry at Fargo, Dak., on the Northern Pacific road, and will soon be ready to begin work.

The Northwestern Car & Manufacturing Co. is pushing work upon its new buildings at St. Paul, Minn. The main building will be 1,200 ft. long and two stories high. The company has arranged to buy out the business of Seymour, Sabin & Co.

Application has been made by creditors to the Supreme Court at Rochester, N. Y., for the appointment of a receiver for the Rochester Car Wheel Works.

The Ohio Falls Car Co., at Jeffersonville, Ind., is building 150 box, 25 stock and 300 coal cars for the Louisville, Evansville & St. Louis road.

Bridge Notes.

Wilkins, Post & Co., in Atlanta, Ga., have lately completed a combination bridge over the Etowah River near Canton, Ga., for the Marietta & North Georgia road.

The Cleveland Bridge & Car Works at Cleveland, O., are busy upon a number of bridge contracts.

Alden & Lassig, at the Leighton Bridge & Iron Works in Rochester, N. Y., have a number of contracts for the New York, Chicago & St. Louis and other roads.

Rust & Coolidge, in Chicago, have the contract for the Texas & St. Louis bridge over the Arkansas River at Pine Bluff, Ark. It will be 1,400 ft. long, with a draw-span and six fixed spans.

Iron and Manufacturing Notes.

The American Bolt Co., at Lowell, Mass., is filling a large order for track-bolts for the Mexican Central road.

Furnace D at the Edgar Thomson Steel Works, near Pittsburgh, has been completed, and went into blast last week.

Messrs. Schrader & Ellery, dealers in rails and railroad supplies, have removed their office from No. 95 Dearborn street to No. 94 East Washington street, Chicago.

Two of the Missouri furnaces at South St. Louis have been repaired and will soon go into blast.

The Superior Rail Mill in Allegheny, Pa., is running on bridge iron and eye-bars.

The Laclede Rolling Mill in St. Louis is running full double turn on orders.

D. W. C. Carroll & Co., in Pittsburgh, are making 10 large oil tanks for the United Pipe Lines, and are also working on a large order for machinery for the Union Iron & Steel Co., of Chicago.

Mr. S. W. Putnam is building a machine shop 128 by 42 ft. and three stories high, in Fitchburg, Mass., where he will manufacture machine tools for railroad and other shops. The business will be conducted under the name of the Putnam Tool Co. The shops will be supplied with all the latest appliances, and will have a switch connection with the Fitchburg Railroad track.

The Powell Iron & Nail Co., in Chattanooga, Tenn., has changed its name to the South Tredegar Iron Co. The company has some heavy contracts for rail splices and other iron on hand.

The first blow in the Bessemer steel works of the Colorado Coal & Iron Co., at South Pueblo, Col., was made April 11. The works have two five-ton converters.

The Edgar Thomson Steel Works turned out over 20,000 tons of Bessemer steel in March.

The Rail Market.

The course of prices has continued downward and an order for 20,000 tons of steel rails is reported placed last week at $50 per ton at mill. Smaller lots have been sold at $52 to $53. It is thought that prices have reached the lowest point, and an active market is looked for.

Some small sales of iron rails are reported at $47 to $51 per ton at mill, according to section. With steel at present prices, it seems as if iron rails must fall somewhat.

Spikes continue at $2.90 to $3 per 100 lbs.; fish-plates, $2.50 to $2.60; track-bolts, $3.70 to $4.10. The market is fairly active.

For steel blooms sellers ask $47 per ton in Philadelphia, duty paid, but business at this price is hardly possible while steel rails continue so low.

No business is reported in old iron rails. Quotations are nominal at $28 to $29 per ton in Philadelphia.

Prices of Scrap Iron.

Pittsburgh quotations for scrap iron and steel are as follows: Old car-springs and axles (steel), $38 to $40 per net ton; wrought scrap, ordinary, $30; selected railroad scrap, $31 to $32; wrought turnings, $22 per gross ton; old car-wheels, $26 to $27 per gross ton for mixed, and $28 to $29 for selected lots; cast borings, $16 per gross ton.

The market is reported dull and with a tendency to lower prices.

A Novel Proposition.

The new railroad from Atlanta to Macon is located a mile from the village of McDonough, the county site of Henry. The citizens of McDonough raised a subscription of $30,000, which they tendered to Major McCracken, manager of the new railroad, if he would change the line so as to run through McDonough. Major McCracken said he could not do that, as he had to adopt the shortest route, but, if the people of McDonough were willing, and would deposit the $30,000 to his credit, for the purpose, he would guarantee, within three months, to move every house in town to the line of road and arrange them as the town authorities should direct, without injury to the buildings. It was thus the McDonough people went out to move a railroad to a town, but met a proposition instead to move the town to the railroad.—*Atlanta (Ga.) Railroad Record.*

The Largest Lake Steamer.

The Chicago *Tribune* of April 20 says:

"Yesterday the steamship Onoko, the largest vessel ever launched on the waters of the great lakes, arrived at this port from Cleveland. She brought a cargo of 2,700 tons of hard coal, the biggest load ever fetched into this port by any vessel, either steam or sail. The Onoko is built of iron, is 302½ ft. long, 25 ft. hold, and 39 ft. beam. She is propelled by a 2,000 horse-power compound engine, and carries four masts. She can be steered either by hand or steam, as occasion requires. The Onoko is not a handsome craft, the design in building her being to make a carrier of her without regard to beauty. That she is a success is fully proven by the fact that, notwithstanding her monstrous cargo, she came into port drawing only 13½ ft. of water. She is commanded by Capt. John Pringle, who says that the great ship behaved finely on the trip up, far exceeding the expectations entertained of her. After discharging her cargo of coal it is probable that the Onoko will go to Escanaba and load iron-ore, though, should grain freights improve, she may take a cargo of corn from here to the lower lakes. Her capacity for corn is 120,000 bushels.

A New Traveling Hoist Crane.

A correspondent writes as follows:

"The Philadelphia & Reading Railroad Company has had built over their tracks at their freight yard, Twentieth and Hamilton streets, in Philadelphia, one of the best machines for handling and loading heavy freight that has ever been used for that purpose. The trestle or bridge covers a span of 83 ft. The main timbers that carry the bridge are very heavy, and anchored on large solid stone foundations at each end. The bridge is self-braced, and made very strong and substantial. It was planned and constructed by Mr. John Foreman, of Pottstown, Pa., the company's Master Carpenter. There are two heavy timbers running lengthwise through the bridge, that the track is laid on, held by 2-in. iron rods that are bolted through the heavy brace timbers overhead, on which the traveling carriage is run. That carries the weight, the space between these timbers being left open to clear the hoist-rope and shine-block.

"The machinery was made by J. S. Mundy, Nos. 22 and 24 Prospect street, Newark, N. J., a well-known hoisting-engine builder, and consists of a pair of 8 by 13 in. cylinder engines, compound, grand and reverse motion, he using his patent friction attachment on the main hoist gear; also one of his patent friction drums for hauling the carriage back and forth over the track. The rope used for hoisting was made by the Hazard Manufacturing Co., and is 1 in. in diameter, made of the best cast-steel wire, the breaking strain, single part, being 24 tons.

"On the 8th inst. there was shipped one of the largest iron rolls ever cast in this country to the Bethlehem Iron Works, Bethlehem, Pa., made by Mr. James Moore's Bush Hill Iron Works in Philadelphia, which measured 46 in. in diameter by 18 ft. long, and weighed 67,283 lbs. It took 33 large horses to haul it from the foundry to the crane, and after the roll had been successfully fastened with heavy chains to the engine belt attached to the heavy carrying shive, the word was given to hoist. Mr. Mundy, the maker of the machinery, stood at the engine and slowly turned on the steam, there being 75 lbs., as indicated by the gauge. The roll was raised, and, being carried over the bridge, it was placed on the car in just seven minutes. The whole machine complete was pronounced a grand success by the great number of persons that saw it."

Fast Time on the West Jersey Road.

The following extract from the train register of the West Jersey road shows the time of a special train run over that road from Camden to Cape May Saturday, April 22; stations where time was not taken are omitted:

	Distances between stations.	Distances from Camden.	Time at stations. P. M.
Camden			2.10½
Gloucester	3.7	3.7	2.16
Westville	1.7	5.4	2.18
Woodbury	2.9	8.3	2.21
Wenonah	3.1	11.4	2.24
Barnsboro	1.8	13.2	2.26
Pitman	2.5	15.7	2.29
Glassboro	1.9	17.6	2.31
Clayton	3.8	21.4	2.34
Newfield	8.5	29.9	2.42
Vineland	4.2	34.1	2.45
Millville	5.8	39.9	2.52
Manumuskin	6.3	46.2	2.59
Woodbine	9.9	56.1	3.08
Seaville	5.8	61.9	3.14
Court House	7.5	69.4	3.21
Rio Grande	5.4	74.8	3.27
Cape May	6.7	81.5	3.34

The train ran through without stopping, taking water at Millville track-tank. From Glassboro to Vineland, 16.5 miles, the time was 14 minutes; Woodbury to Court House, 61.1 miles, in 60 minutes; Westville to Cape May, 76.1 miles, in 76 minutes. The train consisted of engine No. 22 (Class C, anthracite) burning bituminous coal, combined car No. 375, passenger cars Nos. 369 and 600. There were 124 passengers on the train. Conductor Mayhew and Engineer Reinhart ran the train.

Premiums for Tree Planting.

The Northern Pacific Company offers the following premiums to settlers and land-owners tributary to its lines of railroad who shall prove to be the most successful planters and growers of forest trees: First premium: A free pass to St. Paul and Minneapolis and return to the two men in each prairie county through which the lines of the Northern Pacific Railroad may pass who, under the subjoined rules and regulations, accomplish the best results in tree planting. This premium-trip pass to furnish transportation not only for the winner, but also for his wife and children, and so timed as to give him an opportunity of using it in visiting either the state fair in the fall or the annual meeting of the State Forestry Association in the winter. Second premium: A free trip pass to the two next best forest-tree planters, to St. Paul and Minneapolis and return. The premium to be contended for by each of the prairie counties through which the line of road passes and awarded to the men who have shown the next best results in forest culture in their county. This pass to be good for a man and wife only, and so timed as to give the winner an opportunity to visit either the state fair in the fall or the annual meeting of the State Forestry Association in the winter. Third premium: A free trip pass from any station on the Missouri or Dakota Divisions to St. Paul and Minneapolis and return. The premium to be contended for and awarded to the two third best and most successful forest-tree planters from each prairie county traversed by said Dakota and Missouri Divisions.

Sale of Car Works.

The Bellefonte Car Works at Bellefonte, Pa., will be sold at auction in that town May 17, at 2 p. m. The sale will

be positive. The works are on a branch of the Pennsylvania Railroad and are well equipped for the manufacture of freight cars (having a capacity of eight cars a day), in which they have done a large business. Descriptive catalogues can be obtained at the works or of John Roebuck, No. 103 Water street, New York. The land, buildings and water-power will be sold in one lot, the tools, machinery and other personal property in a second lot.

Train Robberies.

A dispatch from Kansas City, Mo., April 21, says: "A passenger from the West reports that an East-bound passenger train on the Atchison, Topeka & Santa Fe Railroad was detained last Sunday night near Rincon, N. M., and that five heavily-armed men attempted to rob the express car. They entered the baggage car by mistake, and before they could get into the express car the trainmen and passengers prepared to fight and the robbers fled. The engine and the baggage and express cars were thrown from the track; the engineer and fireman were killed, and the messenger for Wells, Fargo & Co. was badly wounded. The express car is supposed to have contained $200,000 in silver from the Arizona mines, bound for New York. The robbers were probably informed of this fact by telegraph at Rincon. They belong to a band which has been committing all kinds of depredations in New Mexico and Arizona for months past."

A dispatch from Dallas, Tex., April 21, says: "A car of the Texas Express Company was robbed at 1 o'clock this morning near Ranier, on the Texas Pacific Railroad, by eight men. Four rangers, who have been traveling on the train as guards, opened fire upon the robbers. Thirty shots were exchanged, when the robbers took to the wood. One of the robbers is thought to have been mortally wounded. The night was very dark. The robbers obtained $460."

Car Thieves.

Last Friday night 12 Central employés were arrested at the Scott street crossing charged with stealing freight from cars. The names of the men are William Meyers, Frank Chase, Henry Hill, Thomas Ballard, Anthony Demerse, Frank Fogarty, John Austin, Thomas Doyle, Michael G. Regnet, John Weisbeck, William L. Marshall and William L. Smith. The fellows, who are switchmen and brakemen at East Buffalo, were in the habit of taking tobacco, whisky, dry goods, etc., and selling the goods to Harry Guild, a 16-year-old boy living at 43 Shamway street. A large quantity of goods wat found in the house. It is supposed that the plundering has been going on for some time. The men will be arraigned in the Police Court this morning.—*Buffalo (N. Y.) Express, April 22.*

A Singular Accident.

A strange accident happened on the railway between Rouen and Amiens, France, during the storm which raged there on the 26th ult. A workman named Deteaut, had taken temporary refuge in a cutting close to the line. The telegraph wires were just then blown down and Deteaut got entangled in them. A few minutes after, before he could extricate himself, a train came along, and the wires catching in the wheels the unfortunate man was dragged under the wheels and crushed to pieces.

A Narrow Escape.

As a westward-bound express train on the Pittsburgh, Ft. Wayne & Chicago was passing through the parks in Allegheny recently, a singular accident occurred to a baby of Mrs. T. L. Bender, one of the passengers. She had the car window open and her little child was sitting on her lap leaning out of the window. The infant suddenly made a lurch forward, and before the mother could act, it had fallen out head foremost. Mrs. Bender sprang up and pulled the bell-rope, bringing the train to a stop. Upon going back the baby was found uninjured in the middle of the track. There were only a couple of bruises on its head, and it is a mystery how it was saved at all, as it rolled under the train between the wheels. The mother proceeded on her way rejoicing.—*Pittsburgh Telegraph.*

OLD AND NEW ROADS.

Arkansas State Railroad Bonds.—A test suit has been begun in the United State Circuit Court at Little Rock, Ark., to determine the liability of the railroad companies for the Arkansas state bonds issued to aid their construction and since repudiated by the state. The present suit is against the Little Rock & Ft. Smith Company.

Atchison, Topeka & Santa Fe.—The Boston *Transcript* of April 25 says: "There is a strong party forming in the Atchison Railroad Company desiring a consolidation of the Atchison and Mexican Central roads and the election of President Strong, now of the Atchison Company, as Vice-President and General Manager, and Thomas Nickerson, now of the Mexican Central Company, as President of the consolidated company. We have reasons to believe that some of the largest and most conservative owners of Atchison stock have pronounced in favor of the project, but it is urged that Mr. Nickerson would not consent to it and that he does not believe a consolidation would be best for the interest of either company."

Mr. Nickerson was re-elected to the board on Tuesday, after having been out of it over a year.

Atlantic, St. Johns & Indian River.—Work is soon to be begun on the first section of this road, from St. Augustine, Fla., to the St. Johns River, opposite Palatka, a distance of 29 miles. Surveys are being made for an extension from the end of this first section by Titusville to Enterprise, a distance of 138 miles.

Baltimore & Ohio.—An attempt to extend a branch of the Pennsylvania Railroad over this company's track to some coke works near Mt. Pleasant, Pa., was met with forcible resistance. At latest accounts the Pennsylvania people held the crossing, and an appeal had been made to the courts.

Beaver Dam & Northwestern.—This company has been organized to build a railroad from the Chicago & Northwestern at Juneau, Wis., to Fox Lake, 22 miles. A further extension to Stevens' Point is proposed.

Boston & Albany.—At the adjourned special meeting in Boston, April 26, the stockholders voted to accept the act authorizing the company to buy the state stock and issue bonds to pay for the same. The meeting was a lively one, as described in the following dispatch:

"The opponents of the measure were on the alert bright and early and had secured a lot of proxies. The rules, however provided that no one man could vote by proxy on more than 50 shares. The opposition was headed by J. H. Venner, a broker, who had advertised for 100 men to be at Tremont Temple this forenoon, and at the appointed hour he marched his men down the aisle to cast their ballots against the ratification. The line represented nearly every class, from coal-heavers and day laborers to respectable men in need of money. Many hardly comprehended what was required of them, but finally were induced to deposit a ballot, after which they received from Mr. Venner a certificate entitling them to so much money for their services, the amount being stated as $1. They occupied about 15 minutes in voting, and all of them voted 'No.' Mr. Venner's scheme was quickly copied, and proxies which had heretofore seemed unavailable were utilized by squads of from two to a dozen men. In the meantime, the originator of the scheme, having additional proxies on hand, opened a sort of branch office in one of the committee rooms in the basement of the Temple, where for a time he did a lively business in dealing out his ballots, casting in this way a total of 300 proxies. The polls were kept open until 2.30 o'clock, and the result was as follows: Whole number of shares represented, 89,533; yes, 56,733; no, 32,760."

Boston & Maine.—This company has had a survey made for a branch from Kennebunk station to the town of Kennebunkport, Me. The distance is four miles.

Boston, Revere Beach & Lynn.—A second track will be laid over the whole of this road this season; it will probably be finished by June, with the exception of one mile.

There is some talk of an extension of the road from Lynn through Peabody to Salem, about five miles.

Burlington & Northwestern.—The stockholders of this company met in Burlington, Ia., April 25, and adopted resolutions favoring the sale of the road to the Central Iowa Company, and its consolidation with the Chicago, Burlington & Pacific Company, which is controlled by the Central Iowa

Cairo & St. Louis.—The following circular has been issued:

"The St. Louis & Cairo Railroad Company is now the owner of and operating the railroad heretofore known as the Cairo & St. Louis Railroad. The name of this company will be used in the future. Agents and correspondents will be governed accordingly."

The St. Louis & Cairo Company is the organization formed by the purchasers of the road at foreclosure sale. It has been generally supposed to be controlled by the Texas & St. Louis Company, but this is doubtful.

Central, of New Jersey.—The board of directors met April 20 to consider the question of calling a meeting of stockholders to elect new directors, under the permissive order of the Chancellor. After hearing an opinion from counsel, the board adopted the following:

"The directors having before them an order of the Chancellor made on the 14th inst., and also a letter from E. C. Knight, a stockholder of this company, requesting this board to order an election for directors, and having considered the same, do resolve:

"1. That it is the duty of the directors to cause an election for directors, to be held as soon as it can be done for the best interest of the company, and be legally done.

"2. *Whereas*, This board presented a petition to the Chancellor praying that the property should be turned over to the company, and the Chancellor referred the same to Amzi Dodd, Esq., a master of his court, to report as to the financial condition of the company, and whether the prayer of the petition should be granted, and this board are advised that because of the death of Francis S. Lathrop, the Receiver, said proceedings before the master have abated; therefore,

"*Resolved*, That in order to enable the directors to act intelligently and advisedly upon said order of the Chancellor and the request of Mr. Knight, the present Receiver, Henry S. Little, Esq., be requested to inform the board at his earliest convenience if the condition of the company is such as to justify him in reporting to the Chancellor that the property may now be surrendered by him to the directors, and, if not now, at what future time he will be able so to report.

"*Resolved*, That the said Receiver be requested to furnish to this board, as soon as practicable, a detailed statement of the financial condition of this company, showing the gross and net earnings for each of the past five years, and the excess of such net earnings (if any) over fixed charges in each year; the present amount of the funded and floating debt of the company, and the amount of the same in 1876, when the company failed; together with an estimate of the net earnings for the year 1882, and the amount of fixed charges of all kinds for that year, and such other information as may be proper and necessary to enable the directors to determine as to the condition of the company, financially and otherwise.

"*Resolved*, That this board defer further action on the request of E. C. Knight and the order of the Chancellor until the information above requested shall have been received."

A number of the stockholders have issued a call for a meeting and election to be held May 5, the call being made under an old New Jersey statute, which provides that where directors of an incorporated company fail to call a meeting at the proper time, it may be called by five or more stockholders acting together. It is not certain whether the law applies in this case; it is certain that the present board will contest the legality of the meeting to be held, and will not recognize any directors who may then be chosen.

Chicago, Milwaukee & St. Paul.—A Milwaukee dispatch says: "In the United States Circuit Court last week, in the case of William Barnes, as Trustee, of New York, against the Chicago, Milwaukee & St. Paul Railway Company, a judgment of $1,740,800 was rendered, and as to the balance of $2,592,000, the plea is not sustained, and an order entered that the clerk publish notice to all persons claiming to hold any of this remainder to file with him, specifying the number of their bonds, etc., by the first day of July next; an order of reference to a master to ascertain and report what portion of said claims ought in equity to be enforced was filed. This is an action assailing the validity of the various foreclosures through which the Chicago, Milwaukee and St. Paul Company claims to have acquired title to the property and franchises of the old La Crosse & Milwaukee Company and sought to redeem all the property from lien having priority to the Carnes mortgage, and to compel the Chicago, Milwaukee & St. Paul to make an account of the La Crosse & Milwaukee Company's earnings since 1863, when it went into their possession, and application of such earnings to the extension of such of prior liens. Suit has been going on for nearly twenty years and about $4,000,000 involved. Nearly all of the interested parties are residents of New York."

Chicago & Northwestern.—This company has under consideration the building of a branch from Juneau, Wis., northwest to Stevens Point, about 85 miles. Offers of local aid have been made by towns on the proposed line.

Cincinnati, Hamilton & Dayton.—It is reported that the 9,132 shares of stock held by the Cleveland, Columbus, Cincinnati & Indianapolis Company have been sold by that company to the syndicate which owns the New York, Chicago & St. Louis road. It is also reported that this syndicate will work together with the Erie party, who now own a controlling interest in the road.

Cleveland, Columbus, Cincinnati & Indianapolis.—A dispatch from Columbus, O., April 25 says: "The Supreme Court to-day reversed the decision of the Court of Common Pleas of Franklin County by which an order was issued during the Vanderbilt-Jewett litigation for the appointment of a receiver for the Cleveland, Columbus, Cincinnati & Indianapolis Railway, and all orders in aid of the same. The receiver never took possession, being enjoined on his arrival in Cleveland last September. This virtually does away also with the contempt case and all pending litigation between Vanderbilt and Jewett over the attempted consolidation of the Ohio Railway."

Cleveland, Mt. Vernon & Delaware.—It will be remembered that a short time ago the decree of foreclosure under which this road was sold and passed into possession of the Cleveland, Akron & Columbus Company was set aside by the higher Court, chiefly on technical grounds. The District Court at Akron, O., has now granted a new decree of foreclosure and sale, to take effect unless all the bonds and arrears of interest are paid up within 23 days.

Connotton Valley.—Some of the prominent directors favor a different scheme of reorganization, and issue the following circular to the security-holders of the Connotton Valley Railroad Company and the Connotton Valley & Straitsville Railroad Company: "The undersigned, resident directors of the Connotton Valley Railroad Company, having been assured that the plan of reorganization suggested by the directors of this company in the circular bearing date March 20, 1882, is not likely to receive the support necessary for its success, but that, with certain amendments as suggested below, such support can be obtained, and being desirous, so far as they may, to forward any plan looking to a satisfactory readjustment of the securities of the company, do hereby recommend the following amendments to said plan:

"That the Straitsville bondholders shall, in return for their bonds, receive the same class of bonds as that given in exchange for Connotton Valley Railway bonds, and receive in addition for each $1,000 bond surrendered, five shares of the Connotton Valley Railway Company stock, now in the treasury of the Connotton Valley & Straitsville Railroad Company.

"The acceptance of the plan as thus modified must be accomplished before April 25 to insure its success, and security holders (those who have already assented to the original plan, as well as others) should at once sign the agreement and deposit their bonds with the Boston National Bank according to the terms of the circular."

The circular is signed by Francis Bartlett, A. P. Clark, J. B. Thomas, Cyrus Wakefield and Samuel Watts.

Denver & Rio Grande.—Tracklaying is now in progress on the extension of the Pleasant Valley line in Utah, which this company has bought, from Provo to Salt Lake. From Clear Creek westward towards the Colorado line the grading is done for 45 miles, and tracklaying will be begun as soon as Salt Lake is reached on the other end, and the working force can be taken off that section.

Des Moines & Ft. Dodge.—It is reported that negotiations are pending for a lease of this road to the Chicago, Rock Island & Pacific Company.

Des Moines Northern.—The high bridge over the Des Moines River on this road is nearly completed. It is 2,000 ft. long and 100 ft. above the water, and has cost over $100,000. Grading is now well advanced on the heavy work from the bridge to Swede's Point, Ia., and work has been begun on the line to Boone.

Ft. Wayne, LaFayette & St. Louis.—This company has been organized to build a railroad from Ft. Wayne, Ind., to Logansport, about 75 miles, using the old Wabash & Erie Canal as the road-bed: The line will be parallel and close to the Wabash road. It is reported to have the support of the Terre Haute & Indianapolis Company, which seems somewhat doubtful.

Georgia Pacific.—At a meeting held in Birmingham, Ala., April 19, the contract for the construction of the road was approved. The contract is with the Richmond & Danville Extension Company, and provides for the completion of the road in three years. The consideration is $25,000 in stock and $20,000 in first-mortgage bonds per mile.

Gulf, Colorado & Santa Fe.—Track has been laid to Lampasas Springs, Tex., 48 miles westward from the old terminus at Belton and 274 miles from Galveston. No further work will be done on the main line at present, but the entire construction force will be put on the branch from Brenham to Navasota, the terminus of the Central & Montgomery road, which this company lately bought.

Illinois Central.—It is stated that this company has made a 50-year traffic agreement with the Texas & St. Louis road for an exclusive interchange of traffic, the St. Louis, Alton & Terre Haute road being used for its St. Louis short line. The agreement contemplates the establishment of a through line over the roads named, the Texas & St. Louis Company to receive 25 per cent. of the receipts from through business. This per centage is to be paid, it is stated, into the Central Trust Company of New York as a special guarantee fund for the payment of interest on Texas & St. Louis first-mortgage bonds. The latter road is of 3 ft. gauge, and it has been generally supposed that its St. Louis business would be done over the Cairo & St. Louis road. The Texas & St. Louis will probably be completed to Cairo next fall.

Indianapolis & St Louis.—The United States Circuit Court has refused to grant the application for a receiver of this road, holding that it was unnecessary, as no fraud or mismanagement had been charged. Judge Drummond stated that there was a bill already filed, to which an answer had been put in, admitting all the allegations of the bill, and he could see no good reason why the parties could not go on in that case and take a decree. If it should become necessary after the decree was rendered, in order to preserve all rights, and that a receiver should be appointed, either before or after a sale, he would appoint one, but not at present.

Kankakee & Seneca.—It is stated that the Cincinnati, Indianapolis, St. Louis & Chicago Company has bought the interest in this road owned by the Chicago, Rock Island & Pacific Company, and will hereafter operate the road as part of its own line. The road has lately been completed, and extends from Kankakee, Ill., to Seneca on the Rock Island road.

Lehigh Valley.—The Philadelphia *North American* says that it is admitted that a new contract between this company and the New York, Lake Erie and Western has been virtually agreed upon. The board of directors have yet to act upon it. Under the new contract, it says: "The Lehigh Valley secures facilities for distributing its anthracite coal at all points in the West which the Erie system reaches, or, in other words, a market for 1,000,000 additional tons. The Erie is to take freights in the West, for direct shipment to Philadelphia, and is to enjoy the Lehigh Valley's privileges over the North Pennsylvania between Bethlehem and this city. This arrangement is to extend

over 50 years, and the additional advantages offered thereby to the wholesale trade of Philadelphia, for the cultivation of a larger volume of western business than that which it now enjoys, should not fail of appreciation."

Louisville, New Albany & Chicago.—This company is building extensive shops in Jeffersonville, Ind.

Work is progressing well on the extension from Marion, Ind., to Indianapolis. It is reported that this branch will be extended east from Indianapolis to make a connection with Cincinnati.

Louisville Southern.—It is stated that arrangements have been made to build this road, which is to run from Louisville, Ky., southeast to Harrodsburg, Danville or Nicholasville, the southern terminus not having been decided on as yet. The object of the road is to connect the Louisville, New Albany & Chicago road with the Cincinnati Southern.

Midland North Carolina.—A mortgage for $10,000,000 on this road has been executed and recorded. The road is now graded from Goldsboro, N. C., west 20 miles, and tracklaying has been begun.

Minneapolis & St. Louis.—It is reported that the Chicago, Rock Island & Pacific Company is negotiating for the purchase or lease of this road.

Missouri Pacific.—Track on the Omaha Extension has been laid to Papillion, Neb., on the Union Pacific, 15 miles from Omaha. It is probable that the Union Pacific track will be used into Omaha, although no announcement to that effect has been made. Papillion is 27 miles northward from the late terminus at Weeping Water, and 107 miles from the southern end of the track at Hiawatha, Kan., on the St. Joseph & Western road. Tracklaying has been begun on both ends of the line from Atchison to Hiawatha, about 40 miles.

Nashville, Chattanooga & St. Louis.—This company makes the following statement for March and the nine months of the fiscal year from July 1 to March 31 :

	March.	Nine months.
Earnings	$161,605	$1,473,994
Expenses	85,452	879,199
Net earnings	$75,553	$594,795
Interest and taxes		407,086
Surplus		$187,709

For the nine months there was a decrease of $127,468, or 7.9 per cent., in earnings ; a decrease of $92,826, or 9.7 per cent., in expenses, and a decrease of $34,642, or 5.5 per cent., in net earnings.

New Bonds.—New issues of bonds are offered on the market as follows:

New York, Texas & Mexican first-mortgage bonds are offered for subscription at 94. They will bear 6 per cent interest, have 30 years to run and can be paid for in installments running over four months. The road is to run from Rosenberg Junction, Tex., to Brownsville, about 250 miles. There are 30 miles of track laid and 60 graded.

Morris & Essex first-mortgage real estate purchase money bonds have appeared on the market, although the issue has not been advertised or publicly offered. They have been issued in payment for real estate and terminal improvements on the Hudson River in Hoboken and Jersey City, bought from the New Jersey Shore Improvement Company. The entire issue was made to that company and the bonds are secured upon the property bought. The bonds bear 4½ per cent. interest, have 30 years to run from Jan. 1, 1882, are issued by the Morris & Essex Company and guaranteed by the Delaware, Lackawanna & Western Company.

New York & New England.—The following circulars have recently been issued by General Manager S. M. Felton, Jr.:

"The attention of employés is particularly directed to the importance of promptly delivering messages affecting in any way the safety of trains or the property of this company. Telegraph operators must give such messages immediate attention, and when they are unable to personally deliver them to the parties addressed, must call on trainmen, yardmen, trackmen or other employés whose duties will enable them to make the delivery. In all cases where such requests are made, notify the person of the importance of the message, so there can be no mistake about it. Messages written by the general officers of this company, heads of departments, superintendents, assistant superintendents, train-masters, supervisors, superintendent of bridges or master mechanics at points on the line away from their headquarters, after transmission should be copied and a copy inclosed to the officer. The original message should always be retained for reference. In case a message is sent to any of the above-named officers when away from his headquarters, a copy of such message should always be sent to his office, either by wire, or, when this cannot be done, by train service. This order does not apply in any way to train orders, which, under all circumstances, must receive preference over other business."

"In view of the enormous claims which the courts have allowed for the slightest infringements of patents, it becomes necessary that every improvement of any value which parties in the employ of this company may make in tools, machinery or devices of any kind be thoroughly investigated before being used. Apparently trifling improvements have been and are being patented, and claims are constantly being made for patent infringements. As the use of any patented appliance makes the company liable for damages, *all officers and employés of this company are requested to use no new appliance or improvement, no matter how trifling, without first submitting the same with full description*, so the device may be thoroughly investigated, and protected if necessary."

"Agents and employés of this company are hereby notified that no extra compensation will be paid them for services rendered in connection with traffic handled on account of any of the fast freight lines whose cars are transported by this company. Such services are considered a part of the regular duties of the agents or employés performing them."

It is reported that this company has agreed to sell its Woonsocket Division to the Boston & Albany. The road extends from Brookline, Mass., to Woonsocket, R. I., 30 miles, and has no connection with the main line except over the Boston & Albany track.

New York, New Haven & Hartford.—The Railroad Committee of the Connecticut Legislature has been investigating the charges made against this company by H. L. Goodwin, and reports that no irregularities have been found. The charge of $300,000 appropriated for future improvements made in the last report, was not proper to be made in the expenses of that year, but it did not involve any suspicion of fraud, and was at once corrected when attention was called to it by the Railroad Commissioner.

New York, Susquehanna & Western.—The Paterson Extension is finished and will be opened for business May 1. It is about a mile long, extending from a point near the old Paterson station of the road into the business part of the city. The new station is close to that of the Erie road, and the company will now be able to compete for a share of the Paterson business, from which it has hitherto been shut out by the fact that its station was on the outskirts of the city. The extension has been an expensive piece of road, requiring some heavy work, and a considerable expenditure for right of way.

New York, West Shore & Buffalo.—In the suit of the New York & Albany Company to restrain this company from building its road over certain lands on the west shore of the Hudson River, the New York Supreme Court has given its decision refusing the injunction. The Court holds that the New York & Albany Company has done nothing towards the construction of its projected road, and owns no right of way, while the New York, West Shore & Buffalo Company has a good title.

A dispatch from Syracuse, N. Y., April 23, says: "The New York, West Shore & Buffalo Railroad laid the first rails of the new road in this city to-day. Gangs of trackmen were brought from Oneida and other points on the Midland road this morning, and two tracks laid across the Chenango Valley road. Double tracks were also laid across some salt blocks, the ownership of which is in dispute. The Chenango Valley road, which is owned by the Boston, Hoosac Tunnel & Western, occupy the property, but the West Shore Company claim they have a right to run over it by the decision of a commission appointed by the courts. No attempt was made to interfere with the railroad building by the authorities, although the work was prosecuted all day long in the rear of the largest church in the city."

Oil City & Chicago.—The New Castle & Oil City and the Oil City & Chicago companies have been consolidated under this name. The company owns the line from New Castle, Pa., to Stoneboro, 36 miles, and is building an extension to the Ohio state line to connect with the proposed Buffalo, Pittsburgh & Chicago road. The company is controlled by the Buffalo, Pittsburgh & Western.

Oley Valley & Lehigh.—The survey of this road has been completed from the Philadelphia & Reading road at Birdsboro, Pa., to Seisholtzville, 25 miles. The route is practicable and through a rich country. The building of the road depends somewhat on the willingess of the people on the line to give the right of way or sell it at a reasonable price.

Oregon & California.—The extension of this road is now finally located from Roseburg, Or., south 50 miles to the big bend of Cow Creek. The engineers are now running lines on the southern slope of Siskiyou Mountain. A considerable force is at work on the 33 miles from Roseburg to Myrtle Creek, and the grading and bridging have made fair progress. Contracts have been let for two tunnels south of this section, one to be 775 ft. and the other 2,100 ft. long. Contracts have been let for the ties and bridge timber for 50 miles. The company has steel on hand for 100 miles of road. All the work on this extension is heavy until the line reaches the Rogue River Valley, and can hardly be finished before the close of the present year. In the valley the work will be comparatively light until the approaches to Siskiyou Mountain, near the California line, are reached.

Ovid & Traverse Bay.—This new company is making arrangements to begin work on its line from Ovid, Mich., on the Detroit, Grand Haven & Milwaukee road, north by west to Alma, about 35 miles. The project includes a future extension to Traverse City.

Pennsylvania.—This company's statement shows for March, as compared with the same month last year, on all lines east of Pittsburgh and Erie :

An increase in gross earnings of	$67,989
An increase in expenses of	451,413
Net decrease	$383,424

For the three months ending March 31, as compared with the corresponding period in 1881, the same lines show:

An increase in gross earnings of	$463,232
An increase in expenses of	1,057,744
Net decrease	$594,502

All lines west of Pittsburgh and Erie for the three months of 1882 show a deficiency in meeting all liabilities of $75,034, being a decrease as compared with the same period of 1881 of $995,684.

Philadelphia & Reading.—The Receivers' statement for March and the four months of the fiscal year from Dec. 1 to March 31 is as follows:

	March.		Four months.
Railroad Co.:	Gross earnings.	Net earnings.	Net earnings.
Railroad traffic	$1,527,949.15	$597,104.79	$2,404,496.67
Canal traffic	21,450.22	*23,939.60	*73,618.69
Steam colliers	56,676.25	30,322.46	145,836.02
Richmond barges	4,013.69	*3,047.93	*5,568.07
Total R. R. Co.	$1,610,089.31	$600,439.72	$2,471,145.93
Coal & Iron Co.	977,630.75	55,009.01	207,415.10
Total	$2,587,720.06	$655,448.73	$2,678,561.03

*Loss.

The expenses do not include interest or rentals, the net earnings being the amount from which those charges are to be paid.

A comparison of net earnings is as follows :

	March.		Four months.	
	1882.	1881.	1882.	1881.
Railroad Co.	$600,439.72	$682,456.08	$2,471,145.93	$2,338,110.59
Coal & Iron Co.	55,009.01	34,252.15	207,415.10	210,226.90
Total	$655,448.73	$716,709.03	$2,678,561.03	$2,443,337.49

For March the railroad company shows a loss of $82,016.38, or 12.0 per cent., and both companies a loss of $61,260.30, or 8.4 per cent. For the four months both companies gained $235,223.54, or 9.6 per cent.

Pittsburgh & Western.—The Red Bank & Youngstown Company, which was organized to build the section of this road from the state line to Youngstown, O., has been consolidated with this company.

The company has, it is stated, secured one-fourth interest in the Pittsburgh, Youngstown & Chicago road, which is partly graded from New Castle, Pa., to Akron, O. The other three fourths are owned by the Buffalo, Pittsburgh & Western, the Wheeling & Lake Erie and Andrews, Kurtz & Co., the contractors who have been building the road.

Pullman's Palace Car Co.—A dispatch from St. Louis April 25, says: "The opinion of Judge McCrary, in the case of Pullman's Palace Car Company *vs.* The Missouri Pacific and Iron Mountain railroads, was given to-day in the United States Court. The claim was that the Missouri Pacific Company had given the Pullmans an exclusive right to furnish drawing-room and sleeping-cars for fifteen years over the Missouri Pacific and all roads thereafter controlled by that company. It was further claimed that the Iron Mountain road was now controlled by the Missouri Pacific Company, and an injunction was asked to prevent other sleeping-cars from being used on the former road. Judge McCrary refused the injunction. Justice Miller, of the United States Supreme Court, concurs."

Richmond & Petersburg.—This company has arranged to use the Belle Isle bridge over the James River at Richmond, while its own bridge is being rebuilt. The necessary track connections are now being made.

Saginaw, Tuscola & Huron.—This road is now completed from East Saginaw, Mich., northeast to Sebewaing in Huron County, about 35 miles, and trains have begun to run over the road.

St. Johnsbury & Lake Champlain.—A dispatch from St. Albans, Vt., April 26, says: "The hearing before the Commissioners in the matter of the rates to be paid the Central Vermont for freight transported for the St. Johnsbury & Lake Champlain Railroad between Swanton and Rouse's Point was submitted without argument. The Central Vermont testimony tended to show that considering the heavy cost of building and maintaining the 15 miles of road, and the fact that the business which the present combination desires to take over the road would be largely in competition with the Central, the rate fixed (90 cents per ton) is, if anything, too low. Presidents Anderson, of the Portland & Ogdensburg; Blodgett, of the Ogdensburg & Lake Champlain; Barlow, of the Southeastern; Raymond, of the Passumpsic, and others testified for the petitioners, whose claim is that they desire to make a through line from the West to Northern New England, and are prevented by the high rate on this link in the chain. The testimony has revealed some interesting railroad history, and indicates that the present proceeding is the result of a combination, in which the Vanderbilt people have part, to get into Northern New England, using the Rome, Watertown & Ogdensburg, Ogdensburg & Lake Champlain and Portland & Ogdensburg system in Vermont, New Hampshire and Maine.

"It appeared in the course of the evidence that the bulk of the freight coming from Chicago to Boston *via* the Grand Trunk is at present in the class billed at 64 cents per hundred. Through rates run as low as 30 cents. As soon as practicable the Commissioners will render their decision, which will go to the Supreme Court for approval."

St. Louis, Alton & Terre Haute.—Officers of this company deny that any application for the appointment of a receiver has been made, as was reported in the dispatch published last week. It is probable that the dispatch referred to the Indianapolis & St. Louis Company, lessee of the main line of this road.

St. Paul, Minneapolis & Manitoba.—Tracklaying will soon be begun on the extension of the Grand Fork Branch from Grafton, Dak., north to the Manitoba line.

Selma, Rome & Dalton.—The holders of the old second-mortgage bonds of this road met in New York, April 22, and appointed a committee to secure united action in an attempt to set aside the foreclosure of the first mortgage under which the road passed into the possession of the East Tennessee, Virginia & Georgia Company.

Sharpsville.—This road has been extended from Carbon station southward seven miles to a connection with the New Castle & Oil City Railroad. The junction is at Wilmington station, about nine miles from New Castle. Tracklaying on this extension was completed April 22.

Sonora.—This road is now completed from Guaymas, Mexico, on the Gulf of California, northeast 182 miles. This leaves 88 miles to be completed to Los Nogales, on the Arizona line, where the connection with the Atchison, Topeka & Santa Fe will be made.

Texas & St. Louis.—On the extension of the Texas Division track is now laid to Mt. Olivet, Tex., 12 miles southwest from the recent terminus at Waco, and the grading is finished to Gatesville, 28 miles further.

Wisconsin Central.—The bonds offered to build the extension from Menasha towards Milwaukee have all been subscribed for. Work will be begun on the road as soon as possible. The contract for grading the 30 miles from Fond du Lac to Schleisingerville has been let to Wells, Harrison & Green, of Milwaukee.

ANNUAL REPORTS.

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Pittsburgh, Cincinnati & St. Louis.

For the year 1881 this company worked the following lines, without change from the previous year:

P., C. & St. L., Main Line, Pittsburgh to Columbus	192.8
Cadiz Branch	8.1
Total P., C. & St. L.	200.9
Chartiers R.R.	22.8
Pittsburgh, Wheeling & Kentucky	24.0
Cincinnati & Muskingum Valley	148.4
Little Miami R.R.	195.9
Columbus, Chicago & Indiana Central	580.5
Total	1,172.5

The road owned is the main line from Pittsburgh to New-

ark, O., 159.8 miles, the Cadiz Branch, and one-half interest in the 33 miles from Newark to Columbus, the other half being held by the Baltimore & Ohio as lessee of the Central Ohio.

These lines are the southern group or system of the Pennsylvania lines west of Pittsburgh.

The equipment is as follows:

	P., C. & St. L.	C. & M. V.	Little Miami.	C., C. & I. C.
Locomotives	107	14	47	163
Passenger cars	50	12	35	50
Baggage, mail & express cars	28	4	18	31
Freight cars	4,454	363	687	1,676
Service cars	7	...	...	.....

There are also six engines on the road leased from the Pennsylvania Company. The increase in the Pittsburgh, Cincinnati & St. Louis equipment is 8 passenger cars and 982 freight cars. Of the freight cars on that road, 3,000 are held under a car trust agreement. More freight cars are needed on the leased lines.

The Chartiers and the Pittsburgh, Wheeling & Kentucky roads have no separate equipment.

The general account is as follows, condensed:

Stock, common	$2,508,000 00
" first-preferred	2,929,200.00
" second-preferred	3,000,000 00
Total stock	$8,437,200.00
Funded debt	12,617,000 00
Deferred liabilities	1,351,979.89
Current accounts and balances	1,200,731.45
Total	$23,606,911.34
Road and equipment	$19,979,032.70
Deferred assets	797,113.01
Betterments to leased lines	835,376.08
Securities owned	341,398.75
Current balances and accounts	980,133.05
Cash	297,465.15
Balance, deficiency in assets	376,392.60
	23,606,911.34

The bonded debt consists of $6,863,000 first-consolidated bonds, of which $3,015,000 are coupon and $3,848,000 registered bonds; $3,000,000 Steubenville & Indiana first-mortgage bonds; $120,000 Holliday's Cove first-mortgage bonds and $134,000 Columbus & Newark Division bonds.

The stock issued during the year was $550 first-preferred and $107,300 common, all in exchange for old Steubenville & Indiana stock. There were $179,000 first-consolidated registered bonds issued in exchange for the same amount of Columbus & Newark Division bonds; $702,000 coupon bonds were exchanged for registered bonds.

The report says: "There was apparently an increase of $120,000 in the funded debt of the company; but this was caused by bringing into the accounts of the company the outstanding bonds of the Holliday's Cove Railroad Company for that amount. These bonds were previously held in a trust secured by $150,000 first-consolidated bonds of your company, which, by an arrangement with the trustee, were delivered to your company and the trust closed."

The earnings of the Pittsburgh, Cincinnati & St. Louis proper, 200.9 miles, were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Freight	$2,884,041.07	$3,217,077.96	D. $333,036.89	10.4
Passengers	890,311.22	864,419.17	I. 25,892.05	3.0
Express	91,254.50	70,410.13	I. 20,844.37	29.6
Mails	179,434.42	143,440.67	I. 35,993.75	25.1
Rents, etc	24,012.56	28,058.97	D. 4,046.41	14.4
Total	$4,069,053.77	$4,323,406.90	D. $254,353.13	5.9
Expenses	2,759,740.18	2,290,725.40	I. 469,014.78	20.5
Net earnings	$1,309,313.59	$2,032,681.50	D. $723,367.91	35.6
Gross earnings per mile	20,254.13	21,520.19	D. 1,266.06	5.9
Net earnings per mile	6,517.28	10,117.88	D. 3,600.60	35 6
Per ct. of exp's.	67.82	52.19	I. 14.84	

Large expenditures were made on renewals and improvements, the former including 1,143 tons steel rails, 560 tons iron rails, and 92,736 new ties; 21.9 miles were ballasted with stone. The decrease in earnings was due entirely to lower rates on a larger traffic, while expenses were increased by greater train service and higher cost of labor and materials.

The income account was as follows, somewhat condensed:

Net earnings, as above		$1,309,313 59
Hire of equipment		12,727.50
Interest on investments		9,942.59
Total		$1,331,983.48
Interest on bonds	$846,769.09	
Interest on Little Miami securities, credited to that company	79,444.00	
Interest on car trusts	102,333 58	
Rent of Monongahela extension	39,583.33	
		1,068,130.00
Profit on P. C. & St. L. proper		$263,853.48
Advances to Cinn. & Mus. Vy. Co.	$84,724.49	
Loss on Little Miami lease	267,467.41	
One half loss on St. L., Van. & T. H. lease	170,445.35	
		522,637.25
Deficit for the year		$ 58,783.77
Two back coupons on second-mortgage bonds		262 00.00
Back interest Cin. Street Connection Ry		24,623.04
Total		$545.906.81
Credit balance, profit and loss, Dec. 31, 1880	$97,050.85	
Profit on sale of securities, etc	72,463.36	
		169,514.21
Debit balance, Dec. 31, 1881		$376,392.60

The deficit of $258,783.77 for the year shown above, compares with a net profit in 1880 of $745,866.46, making a total difference of $1,004,650.23 between the two years.

The statements for the leased lines are as follows:

CHARTIERS.

In this short line of 22.8 miles the result was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$110,031.24	$93,733.54	I. $16,297.70	17.4
Expenses	65,443.96	55,841.36	I. 9,602.60	17.2
Net earnings	$44,587.28	$37,892.18	I. $6,695.10	17.7
Hire of equipment	6,368.98	6,161.95	I. 207.03	3.4
Balance, rental paid	$38,218.30	$31,730.23	I. $6,488.07	20.4
Earnings per mile	4,825.93	4,111.12	I. 714.81	17.4
Per cent. of exps	59.48	59.57	I. 0.09	

The increase in business was in passengers and in coal. The increased expenses were due to renewals of track and bridges. The rental paid is the net earnings.

PITTSBURGH, WHEELING & KENTUCKY.

For the 24 miles of this road the following result is reported:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$109,377.25	$91,543.85	I. $17,833.40	19.5
Expenses	72,866.53	57,917.94	I. 14,948.59	25.8
Net earnings	$36,510.72	$33,625.91	I. 2,884 81	8.6
Hire of equipment	8,927.56	8,063.14	I. 864.42	10.7
Balance to credit of P., W. & K. Co.	$27,583.16	$25,562.77	I. $2,020.39	7.9
Earnings per mile	4,557.39	3,814.75	I. 742.64	19.5
Per cent. of exps	66.62	63.27	I. 33.5	

The increase in expenses was mainly due to the increased train service required. The increase in business was in coal, coke, limestone and iron. The expenditures for betterments were $2,089.33.

CINCINNATI & MUSKINGUM VALLEY.

The earnings of the 148.4 miles of this road were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$395,321.39	$364,703.54	I. $30,617.85	8.4
Expenses	375,045.88	319,881.67	I. 55,164.21	17.2
Net earnings	$20,275.51	$44,821.87	D. $24,546.36	50.3
Interest paid	105,000.00	105,000.00		
Deficit	$84,724.49	$60,178.13	I. $24,546.36	40.9
Earnings per mile	2,663.89	2,457.57	I. 206.32	8.4
Per cent. of exp	94.87	87.71	I. 7.16	

The deficit is charged to the account of the leesor company as an advance made by the lessee. There was $150 expended on account of betterments. The renewals included 1,100 tons of iron rails and 48,287 new ties, and the rebuilding of several bridges.

LITTLE MIAMI.

The statement for the 195.9 miles of this road is as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$1,484 365.58	$1,434,506.27	I. $49,859.31	3.5
Expenses	1,187,487.47	1,015,357.97	I. 172,129.50	16.9
Net earnings	$296,878.11	$419,148.30	D. $122,270.19	29.2
Interest, etc	149,735.00	126,594.74	I. 23,140.26	18.2
Total	$446,613.11	$545,743.04	D. $99,129.93	18.1
Rental charges	714,080.52	706,255.42	I. 7,825.10	1.1
Loss	$267,467.41	$160,512.38	I. $106,955.03	66.4
Earn's per mile	7,577.16	7,322.65	I. 254.51	3.5
Per cent. of exps	80.00	70.78	I. 9.22	

On this road 2,008 tons steel rails were laid, leaving but 22 miles of iron in the main track. Betterment expenditures were $127,797.08, entirely on account of the terminal facilities in Cincinnati.

COLUMBUS, CHICAGO & INDIANA CENTRAL.

On the 580.5 miles of this road the results were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$4,953,722.05	$4,795,771.36	I. $157,950.69	3.3
Expenses	4,312,668.96	4,069,510.50	I. 243,158.46	6.0
Net earnings	$ 641,053.09	$726,260.86	D. $85,207.77	11.7
Balance to credit of trustees and receivers	641,053.09	726,260.86	D. 85,207.77	11.7
Earn's per mile	8,533.54	8,261.45	I. 272.09	3.3
Per cent. of exps	87.06	84.86	I. 2.20	

On this road there were used in renewals 7,497 tons steel rails, 2,109 tons iron rails and 296,560 new ties; 207½ miles of track were ballasted. The road shows but a small gain in earnings on a very large increase in traffic. The net earnings are paid into court, pending litigation.

ST. LOUIS, VANDALIA & TERRE HAUTE.

This road, in which this company owns one-half share, is not worked directly, but is leased to the Terre Haute & Indianapolis Company. The result from its 158.4 miles was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$1,541,379.75	$1,560,873.21	D. $19,493.46	1.3
Expenses	1,419,856.55	1,147,094.79	I. 272,761.76	23.8
Net earnings	$121,523.20	$413,778.42	D. $292,255.22	70.6
Rental	462,413.91	468,261.96	D. 5,848.05	1.3
Loss to lessee	$340,890.71	$54,483.54	I. $286,407.17	525.5
Earnings per mile	9,730.93	9,854.00	D. 123.07	1.3
Per cent. of expenses	92.11	73.49	I. 18.62	

The rental is 30 per cent. of gross earnings. Under the agreement, one-half of the loss—$170,445.35—is charged to this company, and is shown in the income account

Trains on this road ran 1,494,444 miles, carrying 308,080 passengers 19,145,269 miles and 1,045,305 tons of freight 108,528,534 miles. There was an increase in traffic, but the average rate per passenger mile was 2.852 cents, against 3.092 cents in 1880, and per ton mile 0.893 cents, against 1.037 cents in 1880.

TRAFFIC OF ALL THE LINES.

The traffic on all the lines operated directly by this company was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Passengers carried:				
P., C. & St. L.	1,017,431	902,454	I. 114,977	12.7
Chartiers	163,417	150,030	I. 13,387	8.9
P., Wh. & Ky.	113,646	93,562	I. 20,084	21.5
Cin. & Mus. Vy.	239,736	210,793	I. 28,943	13.7
Little Miami	987,314	888,791	I. 98,523	11.1
C., C. & I. C.	909,694	814,980	I. 94,714	11.6
Total	3,431,238	3,060,610	I. 370,628	12.1
Passenger miles:				
P., C. & St. L.	38,504,300	36,303,468	I. 2,200,832	6.1
Chartiers	1,774,176	1,638,167	I. 136,009	8.3
P., Wh. & Ky.	1,878,951	1,550,548	I. 328,403	21.2
Cin. & Mus. Vy.	4,838,817	4,356,261	I. 482,556	11.1
Little Miami	24,276,879	23,093,029	I. 1,183,850	5.1
C., C. & I. C.	43,407,476	41,432,531	I. 1,974,945	4.8
Total	114,680,599	108,374,004	I. 6,306,595	5.8
Tons freight carried:				
P., C. & St. L.	3,297,844	3,099,994	I. 197,850	6.4
Chartiers	290,991	218,258	I. 72,733	33.3
P., Wh. & Ky.	145,990	107,695	I. 38,295	35.6
Cin. & Mus. Vy.	280,924	259,057	I. 21,867	8.4
Little Miami	886,415	782,495	I. 103,920	13.3
C., C. & I. C.	2,967,149	2,484,321	I. 482,828	19.4
Total	7,869,313	6,951,820	I. 917,493	13.2
Ton miles:				
P., C. & St. L.	401,946,012	385,153,890	I. 16,792,122	4.4
Chartiers	1,451,723	1,270,692	I. 181,031	14.3
P., Wh. & Ky.	2,976,262	2,345,315	I. 630,887	26.9
Cin. & Mus. Vy.	15,948,908	13,816,861	I. 2,132,047	15.4
Little Miami	71,516 392	63,434.183	I. 8,082,209	12.7
C., C. & I. C.	542,045,108	441,353,949	I. 100,691,159	22.8
Total	1,035,884,345	907,374,890	I. 128,509,455	14.0

It will be observed that there was an increase in traffic, both passenger and freight, on all the lines. For the main line the figures indicate a greater gain in local than in through business. On the Columbus, Chicago & Indiana Central a contrary result is indicated, the gain being apparently more in through than in local traffic. This line reports ton-mileage considerably greater than the main line, and has had a really remarkable gain in freight business during the last three years.

The average receipts and net earnings per unit of traffic on all these lines were as follows, in cents:

	Passenger mile.				Ton mile.			
	Receipt.		Net.		Receipt.		Net.	
	1881.	1880.	1881.	1880.	1881.	1880.	1881.	1880.
P., C. & St. L.	2.310	2.380	0.370	0.750	0.720	0.840	0.220	0.400
Chartiers	3.070	3.000	0 850	0 870	3.330	3.220	1.730	1.570
P., Wh. & Ky	2.680	2.690	0.430	0.630	1.870	2.030	0.320	0.840
Cin. & Mus. Vy.	2.690	2.630	*0.900	*0.800	1.490	1.640	0.230	0.410
Little Miami	2.150	2.290	0.130	0.270	1.100	1.220	0.140	0.320
C., C. & I. C.	2.380	2.430	0.170	0.060	0.670	0.800	0.050	0.100

* Loss.

While three of the lines show an increase in the average passenger rate, the decrease in net passenger receipts is to be observed on all except the Columbus, Chicago & Indiana Central. In freight all the lines show a decrease both in freight receipts and net earnings, except the Chartiers road, which is only 24 miles long and has an entirely local traffic.

Some figures for train and car mileage, taken from the very complete tables in the report of Vice-President and Comptroller Thomas D. Messler, are as follows:

	Train miles.	Car miles—Pass. train.	Car miles—Freight.	Av tr. load—Pass.	Av tr. load—Tons.
P., C. & St. L.	3,498,687	4,679,389	45,504,259	51.36	185.68
1880	3,131,473	4,147,588	44,717,728	55.79	191.34
Chartiers	78,376	180,808	225,639	39.36	60.82
1880	81,114	167,187	210,581	32 89	58.77
P., Wh. & Ky	103.441	182,746	473,251	29 00	146.66
1880	88.288	167,456	400,377	29.52	132.44
Cin. & Mus. Vy	409,905	595,384	2,620,002	22.65	103.54
1880	393 185	599,601	2,364.794	20.54	101.02
Little Miami	1,403,515	2 604,662	9,989,549	44.31	135 97
1880	1,271,205	2,520,924	9,149,544	42.90	132.67
C., C. & I. C.	5,751,032	5,271,615	65,352,554	36.24	161.53
1880	4,961,025	5,062,357	55,682,965	36.63	151.47

On the Pittsburgh, Cincinnati & St. Louis the average freight train had 21.02 cars. The average earnings per train mile for all trains were 139.62 cents gross and 44.93 cents net. On the Chartiers road trains earned 159.58 cents gross and 64.67 cents net. On the Pittsburgh, Wheeling & Kentucky the earnings per train mile were 128.84 cents gross and 43.01 cents net. The Cincinnati & Muskingum Valley shows earnings of 107.53 cents gross and 5.52 cents net per train mile. On the Little Miami the average train earned 138.23 cents gross and 27.65 cents net per mile. The Columbus, Chicago & Indiana Central shows earnings of 108.79 cents gross and 14.08 cents net per train mile. With a general increase in train mileage there was a general decrease in earnings per train mile.

GENERAL REMARKS.

The General Manager's report shows an increase in expenses due to increased traffic, and a considerable increase in the proportion of expenses, resulting from the general prevalence of lower rates on through business. The general condition of all the roads was well maintained, and some important improvements made. Among these were the extension of the second track to McDonald, 18.4 miles from Pittsburgh, and the rebuilding of the Monongahela bridge at Pittsburgh with a double track. The work of shortening and straightening the line by the construction of the Gould tunnel is making good progress.

Nine new engines replaced old ones worn out; 500 new box and 500 stock-cars were put on the road under a car trust.

President Roberts' report says: "It will be noticed that, with the exception of the Chartiers Railway, the average rate received for the transportation of tonnage was reduced on all the roads operated by your company, and that, by reason of the severe winter of 1880—81, and of the advance in the price of labor and materials, the cost of the same was increased, except in the cases of the Pittsburgh, Wheeling & Kentucky Railroad and the Columbus, Chicago & Indiana Central Railway, on which lines very extensive repairs had been made in the previous year. It will also be noted that the average rate received for the carriage of passengers was generally reduced, and the cost increased from the same causes that operated in the case of the tonnage.

"There were carried over all your lines 8,914,618 tons of freight and 3,739,318 passengers, being an increase of 951,719 tons and 392.754 passengers, or nearly 12 per cent. in both classes of traffic.

"No change has taken place in the litigation between your company and the Columbus, Chicago & Indiana Central Railway company with reference to the lease of its road by your company. The bondholders of that company, however, have taken steps looking to a foreclosure sale of its property and a reorganization of the company, which, should it take place, may probably lead to some settlement of this long and vexatious litigation on a basis satisfactory to all parties."

Atchison, Topeka & Santa Fe.

At the close of the year 1881 this company worked the following lines, those nominally leased and under separate organizations being practically owned:

	Miles.
Atchison, Topeka & Santa Fe, main line, Atchison to western boundary of Kansas	470.58
Kansas City, Topeka & Western, Kansas City to Topeka	68.22
Pleasant Hill & De Soto, Pleasant Hill, Mo., to Cedar Junction, Kan	44.89
Kansas City, Emporia & Southern, Emporia to south line of Greenwood County	64.21
Elk & Chautauqua, south line Greenwood County to Howard	11.84
Florence, El Dorado & Walnut Valley, Florence to Douglas	53.59
Marion & McPherson, and extension, Florence to Ellinwood	98.61
Wichita & Southwestern, Newton to Wichita	27.28
Cowley, Sumner & Fort Smith, Wichita to Arkansas River	68.61
Wellington to Caldwell	23.32
	91.93
Pueblo & Arkansas Valley, Kansas state line to South Pueblo	148.72
Pueblo to Coal Banks (Rockvale, Col	37.01
La Junta Junction to New Mexico line	96 37
	282.10
New Mexico & Southern Pacific, Colorado state line to San Marcial, N. M.	353 97
Santa Fe Branch	18 12
	372.09
Rio Grande, Mexico & Pacific, San Marcial to Deming, N. M.	129.04
Rincon to Texas boundary	57.04
	186.08
Rio Grande & El Paso, New Mexico line to El Paso, Tex.	20.15
Total	1,789.67

The company also owns all the stock of the Kansas City, Lawrence & Southern Kansas Road, 384.48 miles, and one-half interest in the Manhattan, Alma & Burlingame road, 56 62 miles; the operations are not included in the report.

The increase of mileage during the year was 250.34 miles. The average mileage worked was 1,695.43 miles in 1881, and 1,371.91 miles in 1880.

The new lines in progress are the Harvey County road, Sedgwick to Halstead, 8.89 miles; the Kansas City & Olathe road, Olathe, Kan., to Choteau, 12 miles; the New Mexican road, Las Vegas to Hot Springs, 6 miles and coal branches, 15 miles; the New Mexico & Arizona road, Benson, Arizona, to Los Nogales, 95 miles, and the Sonora road, from Los Nogales to Guaymas, Mexico, 270 miles.

The equipment consists of 251 locomotives; 89 passenger, 2 chair, 18 Pullman, 25 emigrant sleeping and 60 baggage, mail and express cars; 3,939 box, 717 combination, 801 stock, 917 flat, 2,309 coal and 113 caboose cars; 2 officers' cars, 2 pay cars and 10 service cars. Additions during the year were 94 engines, 92 passenger-train cars, 3,587 freight cars and 5 service cars.

Of the land grant 2,474,326.47 acres have been patented to the company and 458,457.58 acres are due. Sales in 1881 were 50,033 84 acres for $261,544.01. Cash receipts on land contracts were $558,550.37; the expenses of the Land Department, including taxes, were $134,623. Total sales to Dec. 31, 1881, were 1,058,758.53 acres on which the total cash receipts have been $4,237,218.98. The Land Department holds land notes amounting to $2,027,882.77. The total amount of principal and interest on all sales made has been $8,151,373.62, including both cash and time sales.

The general account, somewhat condensed, is as follows:

Stock		$47,133,900.00
Convertible scrip		28,800.00
Bonds		29,510,000.00
Stock subscription account		581,474 55
Accrued interest		709,386.59
February dividend		747,434.50
Accounts and balances		4,773,078.76
Cancelled bonds		391,500.00
Profit and loss		1,913,145.02
Income account		4,154,481.93
Total		$80,943,201.35
Road and equipment	$32,402,636.46	
Permanent interest in leased lines	36,910,550.00	
Leased lines, securities and accounts	5,788,171.32	
Sundry securities, cost	401,763.25	
Atlantic & Pacific Co	53,505.00	
Land bond accounts	205,676.91	
U. S. Government	834,018.29	
Materials	1,854,930.76	
Accounts receivable	1,324,936.59	
Cash	1,167,012.77	
		80,943,201.35

The above assets are exclusive of the bills receivable for sales of land to Dec. 31, 1881, amounting to $2,027,882.77, and the value of about 1,850,000 acres of unsold lands.

The outstanding bonded indebtedness of the leased roads is not charged in the liabilities of the Atchison Company, as the value of the Atchison Company's interest in the leased roads, which appears in the assets, is exclusive of the value covered by these bonds.

Of the bonded debt $3,354,000 are land grant and land income bonds, the interest and principal of which are payable from land receipts. Excluding these bonds, the funded debt of the Atchison Company is $17,156,000; that of the leased lines is $11,348,000, making a total of $28,504,000, or $17,797 per mile, the yearly interest charge being $1,910,855 or $1,068 per mile. This does not include leased line bonds held by the company.

During the year new stock was issued to the amount of $22,242,900, of which the sum of $15,692,100 was distributed to stockholders; $6,267,400 sold for cash; $149,900 exchanged for Wichita & Southwestern stock, and $133,500 exchanged for consolidated bonds.

There were $133,500 bonds exchanged for stock and $379,500 retired by sinking funds; $5,150,000 new 4½ per cent. bonds were issued, making a net increase of $4,637,000 in the funded debt.

Additions to construction account for new construction and equipment (not including new roads built) were $5,536,310.74, of which $3,039,783.89 were for new equipment, the largest items being for new locomotives and new freight cars.

The traffic for the year was as follows:

Train miles:	1881.	1880.	Increase.	P. c.
Passenger	1,726,127	1,277,044	449,083	35.2
Freight	3,300,351	2,553,238	747,113	29.3
Service and switching	2,322,853	1,508,567	814,286	54.0
Total	7,349,331	5,338,849	2,010,482	37.7
Passengers, west	264,897	196,748	68,149	34.6
" east	236,966	184,574	52,392	28.3
Total	501,863	381,322	120,541	31.6
Tons freight, west	796,292	642,519	153,773	23,9
" east	370,191	311,182	59,009	19.0
Total	1,166,483	953,701	212,782	22.3

The excess of west-bound tonnage is notable. Locomotive service cost 22.91 cents per mile run. The large mileage of service trains may be accounted for by the building of so much new road, requiring a heavy construction train mileage.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Freight	$9,051,622.61	$6,499,980.79	I. $2,551,641.82	39.3
Passengers.	2,970,608.44	1,786,901.41	I. 1,183,707.03	66.2
Mail	216,880.05	173,955.50	I. 42,924.55	24.7
Express	267,789.20	89,707.63	I. 178,081.57	197.9
Miscellaneous	77,608.29	6,430.61	I. 71,177.68	
Total	$12,584,508.59	$8,556,975.94	I. $4,027,532.65	47.1
Expenses	8,037,826.36	4,343,205.40	I. 3,694,620.96	85.1
Net earnings	$4,546,682.23	$4,213,770.54	I. $332,911.69	7.9
Gross earn. per mile	7,422.61	6,237.27	I. 1,185.34	19.0
Net earn. per mile	2,681.73	3,071.46	D. 389.73	12.7
Per cent. of exps.	63.87	50 75	I. 13.12	

The increase in expenses, aside from the working of so much new road, was due to the heavy renewals required on the older part of the road, originally laid with light iron, as but a light business was then anticipated. The increase of business has been much greater than that in mileage.

Besides the expenditures elsewhere noted, more are needed for additions to the property, and arrangements were made for issuing $4,712,700 new stock, the proceeds of which will be used to pay for 97 engines, 20 passenger and 475 freight cars already ordered, and for the extension and fitting up of the repair shops.

The income account, somewhat condensed, is as follows:

Gross earnings		$12,584,508.59
New Mexico & Southern Pacific rebate, previously charged to income		180,323.46
Balance of general interest account		49,513.35
Total		$12,814,345.40
Worsing expenses	$7,774,341.35	
Taxes	263,485.01	
Total	$8,037,826.36	
Rental of rolling stock	25,500.00	
Interest on bonds	866,663.33	
Sinking funds	132,029.00	
Interest on bonds of leased lines	774,740.00	
Dividends, 5¼ per cent	1,841,020.50	
Sundry accounts	4,494.36	
		11,682,273.55
Surplus for the year		$1,132,071.85
Surplus from previous years		3,022,410.08
Credit balance of income, Dec. 31, 1881		$4,154,481.93

The interest on bonds charged included interest accrued up to Dec. 31, but not yet payable.

The profit and loss account is as follows:

Balance from 1880		$5,027,289.63
Sundry profits		5,254.12
Interest in leased and connecting roads (not including the Atlantic & Pacific or roads under construction) represented by stock owned		13,530,550.00
Total		$18,563,093.75
Sundry losses	$5,873.73	
Cost of stocks of leased roads in 1880 and 1881	923,175.00	
Surplus distributed in 1881	15,720,900.00	
		16,649,948.73
Balance to 1882		$1,913,145.02

General Manager C. C. Wheeler's report gives the following statement of the new roads built and under construction:

"In Kansas, the Marion & McPherson extension from Lyons to Ellinwood, 19.84 miles, was completed Sept. 1, 1881.

"The Florence, Eldorado & Walnut Valley Railroad, 24.27 miles, was completed to Douglass Aug. 1, 1881.

"The Harvey County Railroad from Sedgwick to Halstead, 8.89 miles, was completed Dec. 31, 1881.

"For the accommodation of the Kansas City, Lawrence & Southarn Kansas road a short line is being built from Olathe to Choteau on the Kansas City, Topeka & Western road, which is expected to be completed by May 1, when the business for Kansas City will be transported wholly over the lines controlled by the Atchison Company.

"The Rio Grande, Mexico & Pacific Railroad from San Marcial to Deming, 129.04 miles, was completed March 1, 1881 from Rincon to the Southern boundary of New Mexico, 57.04 miles, July 1, 1881.

"The Rio Grande & El Paso Railroad in Texas, 20.15 miles, was completed July 1, 1881.

"The total mileage, 256.61 miles, was turned over to the operating department as named above.

"On the New Mexico & Arizona Railroad, 18.30 miles of track had been laid, up to Dec. 31, 1881. It is now expected that this line will be completed to Los Nogales by about June 15, 1882.

"We have constructed a short line from the main line near Raton into Dillon Cañon, for coal. The length of this line with side tracks is 6.74 miles.

"There is also under construction a line from San Antonio to the San Pedro coal-fields. The length of this line is 8.54 miles, and will be completed about April 1, 1882."

An agreement has been made by which the line to connect with the Sonora Railroad at the Mexican boundary starts from Benson, Ariz., instead of Deming, N. M., and this company secures the use of the Southern Pacific track from Deming to Benson, 174 miles.

A second mortgage, not to exceed $10,000 per mile, has been put on the New Mexico & Southern Pacific road, to pay for heavier rails and other improvements. By agreement the rebate heretofore paid to that company has been given up, and in return the Atchison Company guarantees its first-mortgage bonds, which are about $15,000 per mile.

The company has secured absolute control of the Sonora Railroad, and that road will become part of its system as soon as finished.

The report of President Wm. B. Strong says: "It may be here stated that, to simplify the arrangements between your company and its various leased and connecting roads, the old leases have been modified, and the new leases (except that for the Florence, El Dorado & Walnut Valley Extension) have been so arranged that, instead of a rental based on earnings, the Atchison Company will pay as and for rental the interest on their bonds.

"The only bonds placed on the market by your directors during the year were the Atchison, Topeka & Santa Fe Company's 4½ per cent. sinking fund bonds for $5,150,000.-00, secured by a corresponding amount of the first-mortgage bonds of the Rio Grande, Mexico & Pacific and the Rio Grande & El Paso Railroad companies.

"The funds for building the New Mexico & Arizona road have been furnished by your company as yet without any securities being issued therefor, and for part of the expenditures on other leased roads your company holds first and second-mortgage bonds.

"A cheap and abundant supply of fuel is of so much importance in the operation of your road that it was deemed necessary to secure a partial or entire interest in various coal properties in Kansas, Colorado and New Mexico, which when fully developed will not only materially reduce the cost of coal to your company, but will also build up a large transportation business.

"The contract made with the Pullman Company some years ago contained a proviso that, upon payment of one-half the cost of the cars in use or to be furnished from time to time, your company should receive one-half the profits. Your directors availed themselves of this right in the early part of the year, and the profit received is included in the miscellaneous earnings.

"In the last annual report, reference was made to the purchase of the Kansas City, Lawrence & Southern Kansas Railroad, in order to protect the business of your company in that part of Kansas. The interest and sinking fund (amounting yearly to about $222,300) of the bonds of your company, issued on account of this purchase, have been included in the charges to the income account of the Atchison Company, but no earnings from the Kansas City, Lawrence & Southern Kansas road have as yet been brought into the accounts against this charge. The opinion, however, expressed by your former President, that the road would become a valuable property, is being verified, the road having earned during the past year more than sufficient to pay the operating expenses and taxes, and interest on its bonded debt. Should the crops prove favorable in 1882, as appears likely from present prospects, the surplus will probably be sufficient to meet the charges for interest, etc., on the Atchison Company's bonds above referred to. The Kansas City business of this road has hitherto been delivered to the Fort Scott & Gulf Railroad at Olathe, distant from Kansas City about 20 miles; but your company has been building a road of about 12 miles from Olathe to Choteau, on the Kansas City, Topeka & Western Road, which will be completed by May 1, when the business referred to will be transported wholly over your lines. The Kansas City, Lawrence & Southern Kansas Railroad and the Manhattan, Alma & Burlingame Railway are operated separately from the Atchison system, and neither the earnings nor expenses are included in the accounts of the Atchison Company.

"The Atlantic & Pacific Railroad, in which this company has an important interest, had reached at the close of the year 300 miles west of Albuquerque. It is still progressing rapidly. The money needed for completing the road to the Colorado River has been raised recently by a new subscription, and the road will probably reach the Colorado River within the present year. Its further continuation will then receive proper consideration.

"At the request of the St. Louis & San Francisco Railway Company, a short line has been built by your company from Sedgwick, on the Wichita road, to Halstead, on the main line, so as to shorten the distance for through traffic. Under certain conditions, the St. Louis Company will be allowed to run their trains over this road to Halstead; but your company can terminate the agreement by giving proper notice to the St. Louis Company."

Allegheny Valley.

This company owns the River Division from Pittsburgh to Oil City, 132 miles; the Plum Creek Branch, 7 miles; the Low Grade Division, from Red Bank to Driftwood, 110 miles, and the Sligo Branch, 10 miles, making 259 miles in all.

The following statements for the year 1881 were presented at the recent annual meeting in Pittsburgh.

The liabilities of the company were as follows:

Stock	$2,166,500
Bonds prior to income bonds	16,900,000
Income bonds	8,171,700
Floating debt, accounts and balances, etc	3,863,938
Total	$31,102,138

The interest on the income bonds is payable in scrip convertible into new bonds, when the earnings of the road are not sufficient to pay in cash.

The earnings for the year were as follows:

	1881.	1880.	Increase.	P. c.
Freight	$1,626,892	$1,419,814	$207,678	14.6
Passengers	482,060	440,430	41,630	9.4
Mail, etc	60,835	59,285	1,550	2.6
Total	$2,169,787	$1,919,529	$250,258	13.0
Expenses	1,265,114	1,087,227	177,887	16.4
Net earnings	$904,673	$832,302	$72,371	8.7
Gross earn. per mile	8,378	7,411	969	13.0
Net " "	3,493	3,214	279	8.7
Per cent. of exps	58.31	56.64	1.67	

Of the increase in freight earnings, $141,289 were from coal. There was also a considerable increase from lumber, refined oil and general freights, with a slight decrease in crude oil. The increase in passenger earnings was from local travel.

The income account was as follows:

Net earnings	$904,672.90
Interest on mortgage bonds, ground rents and car trust	1,147,293.81
Deficit	$242,620 82
Interest on income bonds	543,575.49
Total deficit in interest	$786,196.31
New construction	38,092.59
Paid state on account of Low Grade second-mortgage	100,000.00
Total deficit	$924,288.90

This total deficit is accounted for by an increase in liabilities, the principal item being an increase in coupons of first-mortgage bonds, Low Grade Division, purchased and held by the Pennsylvania Railroad Company under its guarantee, and by payment of interest on the income bonds in scrip.

There were 2,103 tons of steel rails put in the track during the year 1881, of which 917 tons were used on the River Division, and 1,186 tons on the Low Grade Division.

At the close of the year, 136.2 miles, or 95¼ per cent. of the total number of miles of double and single track of the River Division were of steel rails; and on the Low Grade Division, 59 miles, or 53.63 per cent. were of steel.

There were put in the track during the year 1881, 117,-274 cross ties, distributed as follows: River Division, 65,465; Low Grade Division, 47,839; Sligo Branch, 3,470.

The requirements of steel rails for the year 1882 are estimated as follows: River Division, 800 tons; Low Grade Division, 2,500 tons; total, 3,300 tons.

The 800 tons for the River Division will fully equip the main line of that division with steel.

A freight depot, 481 ft. long and 85 ft. wide, was erected at Sixteenth street, Pittsburgh, during the year. There has been an average of 16 cars per day loaded at this depot for other roads since its opening, about the middle of December.

The passenger business for the past year was conducted without loss of life or any injury whatever to passengers, and the amount paid for loss and damage to freight was very small.

Central of New Jersey.

The only report made public by the Receiver of this road is that which he is required by law to file with the Comptroller of New Jersey. This is brief and unsatisfactory in form, and covers only the 190 miles of road in that state, making no statements for the leased lines in Pennsylvania. The figures given in that report for the year 1881 are as follows:

The capital account is stated as below:

Stock		$18,563,200.00
Bonds		37,757,350.00
Other indebtedness	$3,835,757.10	
Less cash and receivables	1,393,195.00	
		2,442,562.10
Total		$58,763,112.10
Railroads owned	$13,870,469.41	
Jersey City station	1,305,805.50	
Port Johnston coal station	601,768.66	
Elizabethport station	405,057.60	
Stations, shops, etc	824,850.42	
Equipment	4,644,515.00	
		21,712,466.59
Excess of liabilities		$37,050,645.51

This excess of liabilities represents the amount invested in leased and controlled lines, coal properties, terminal companies, etc., and losses on past business.

Stock is unchanged; bonded debt increase $753,350 during the year. The floating debt reported a year ago was $1,806,754.

The stock is $142,794 per mile owned, and the bonded debt $289,660 per mile, a total of $432,454 per mile owned.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Passengers	$2,148,383	$1,771,281	I. $377,102	21.3
General freight	1,812,108	1,431,388	I. 380,720	26.6
Coal	2,370,482	1,930,453	I. 440,029	22.8
Mail, etc	263,910	173,848	I. 90,062	51.8
Total	$6,594,883	$5,306,970	I. $1,287,913	24.3
Expenses	4,364,235	3,161,748	I. 1,202,487	38.0
Net earnings	$2,230,648	$2,145,222	I. $85,426	4.0
Gross earn. per mile	34.605	29,483	I. 5,122	17.6
Net " "	11,740	11,918	D. 178	1.5
Per cent. of exps	66.17	59.58	I. 6.59	

No statement of payments from net earnings is made. The road shows a large increase in all its traffic, and also a very large increase in expenses, leaving the net earnings but a trifle larger than last year.

The earnings of the 204 miles in Pennsylvania leased from the Lehigh Coal & Navigation Company are reported by the lessor company at $4,222,517. This brings the total earnings up to $10,817,400, and there are some minor branches not included.